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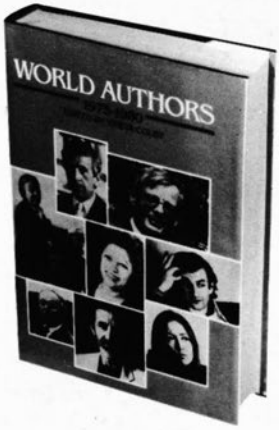

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COLLEGE & RESEARCH LIBRARIES

MAY 1986
VOLUME 47
NUMBER 3
ISSN 0010-0870

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College & Research Libraries (ISSN 0010-0870) is the official journal of the Association of College and Research Libraries, a division of the American Library Association. It is published bimonthly at 50 E. Huron St., Chicago, IL 60611. Second-class postage paid at Chicago and at additional mailing offices. **POSTMASTER:** Send address changes to *College & Research Libraries,* 50 E. Huron St., Chicago, IL 60611.

Manuscripts of articles and copies of books submitted for review should be sent to the Editor: Charles R. Martell, Editor, *College & Research Libraries,* The Library, 2000 Jed Smith Dr., California State University, Sacramento, CA 95819. Phone 916-454-6466.

Instructions for authors and further information on submission of manuscripts are included in a statement on p.112–13 of this volume of *College & Research Libraries.*

Production and circulation office: 50 E. Huron St., Chicago, IL 60611. Advertising office: Art Beck, Advertising Sales Manager, *Choice,* 100 Riverview Center, Middletown, CT 06457, 203-347-1387. Change of address and subscription orders should be addressed to *College & Research Libraries,* for receipt at the above address, at least two months before the publication date of the effective issue.

Annual subscription price: to members of ACRL, $17.50, included in membership dues; to nonmembers, $35. Retrospective subscriptions not accepted. Single copies and back issues, $7.50 each.

Inclusion of an article or advertisement in *College & Research Libraries* does not constitute official endorsement by ACRL or ALA.

A partial list of the services indexing or abstracting the contents of *C&RL* includes: *Current Index to Journals in Education; Information Science Abstracts; Library & Information Science Abstracts; Library Literature;* and *Social Sciences Citation Index.* Book reviews are included in *Book Review Digest, Book Review Index,* and *Current Book Review Citations.*

Editorial

New Programs, Existing Programs

In an open letter to the California State University Board of Trustees, Scott Rice, a professor, complains, "Administrators, for all their obvious usefulness, have certain generic weaknesses. Administrators like to divert money to create new 'programs,' while not looking to the health of existing ones." This statement intrigued me when I first read it. So I earmarked it for further attention.

Later, Joseph Kramer, a science librarian here at CSU–Sacramento, routed the same letter to me and earmarked the same quote. "Charlie, pay close attention! This is a profoundly important statement."

Joe has sent several key articles to me over the years. A notable example is William Miller's much-discussed article "What's Wrong with Reference?" that appeared in *American Libraries* (May 1984). Joe and I often have different perspectives on the issues raised by these articles. But, we agree closely on the importance of the problems that they address.

The creation of new programs seems to cause trauma at many levels. Both the positives and the negatives are amplified. Rice uses straw-man imagery. He points to generic weaknesses. We see the us'n' them scenario played out once again.

Nevertheless, Rice's statement remains intriguing for two reasons. First, we are led to infer that the creation of a new program automatically implies the neglect of an existing program. Second, we are led to infer that administrators are the primary change agents in the academic community. I arrived at this second inference by recasting Rice's logic in terms of the faculty. That is, faculty look to the health of existing programs but do not like to divert money to create new ones.

Personally I have problems with both inferences. Neither is valid. For example, a new program may impact an existing program, but an automatic inference of neglect is unwarranted.

Recently, college-level remedial English programs have come under fire because they divert funds from a posited "real" purpose of the university. Some, including both faculty and administrators, also argue that the teaching of remedial English by universities relieves the K–12 system from its basic responsibility to prepare graduates who can read and write. Others, including both faculty and administrators, argue that if the K–12 system cannot do the job, the university must pick up the slack so its graduates can read and write.

This is a complicated issue. If we cast labels on others we will do little to promote understanding or progress. Common stereotypes only make it easier for some to turn away and to reject responsibility. Individuals who become involved may be scolded because narrow self-interests are impacted. This pattern of behavior is played out daily.

Indeed, the key to the debate on many issues probably centers on the personal interests of the participants. For the instructional faculty, it is often a matter of the number and kind of courses that they teach. Learning and the acquisition of knowledge may at times take second place to bread-and-butter issues.

This is not new. If I were to search for a place to locate a generic weakness, it would be between our interest toward self and our interest toward others. Certainly, administrators

may be more inclined to support a change in an educational program than a change in an administrative program. The location of the impact and its remoteness from self will often influence one's receptivity toward change.

If we use life and death symbols to flavor the debate on new programs and existing programs, we obscure enlightenment. Our own self-interests need to be examined with greater candor. As a corollary, all parties need to be sensitive to personal factors if we are to make significant progress in resolving complex issues.

Movement toward new programs can be both beneficial and threatening. Clear reasoning will help us to avoid the dilemma of the old horse-lover, who, when confronted with the horseless carriage in the early 1900s, exclaimed, "If only we provided a good nutritional diet for our horses, then they would be just as fast."

We need to place our bets more wisely.

CHARLES MARTELL

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Selected Papers from the ACRL Fourth National Conference, Baltimore, April 9–12, 1986

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by Joel Rudd and Mary Jo Rudd

Performance Appraisal: Is It Working?
By Charles A. Schwartz

The Managerial Roles of Academic Library Directors
By Michael Ann Moskowitz

The Effect of Service Awareness on Survey Response
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Conversation, a New Paradigm for Librarianship?

Joan M. Bechtel

Criticized for their isolation from the central mission of the college or university and, at the same time, struggling to accommodate the tremendous growth of information and technology, academic librarians need a new paradigm for library service that will effectively direct and inform planning for the future. Conversation, crucial for human life in society and intrinsic to the nature of libraries, may well be the appropriate model for providing the guidance, means, and context for change in academic librarianship.

That these are challenging, often difficult, times for academic libraries is no news to anyone in the library world. Concern for professionalism, with its attention to accountability and responsibility, abounds. Unprecedented growth in technology provides vast new opportunities for communication, and the availability of information far outstrips most people's capacity to digest it all. In the face of this information explosion, it is ironic that academic librarians are casting about for an appropriate myth or model for library service. Witness the ACRL Third National Conference (April 4–7, 1984), called to address the issue of the present and future direction of academic libraries. While several of the participants in that conference called for a new paradigm for librarianship or suggested possibilities in the search for one, a compelling new image for trenchant library service was not found. While critics charge that academic libraries are not sufficiently integrated into the central concerns of the college or university and that librarians have their own, independent agendas, librarians responsible for present services as well as plans for the future are uneasy. Perhaps it is an overstatement to say that academic librarians are drifting in a vast sea of information and technological advances, searching for an appropriate course of action. Nevertheless, we appear to have lost the stabilizing rudder of confidence in who we are and what we are to do. As a more powerful alternative to the images of librarianship already available or proposed, I suggest that we begin to think of libraries as centers for conversation and of ourselves as mediators of and participants in the conversations of the world.

OLD IMAGES

Libraries in the past have been labeled "The heart of the college or university," "the center of our intellectual life,"[1] or a "warehouse for storing books." If the "heart of the college" cliché is correct, heaven help the educational world; the library functioning as the heart of the college works about as well as the Jarvic 7. Fortunately, however, for the colleges and universities of the land, the library never was the "heart of the college," and today the claim is little more than sentimental garbage trotted out by presidents and deans when they are required to say something flattering about libraries; neither the speaker nor the hearers believe it. As a paradigm for library service it provides no clues to the services needed in the university, nor does it help to clarify the role of librarians in the educational process.

The characterization of libraries as the "center of our intellectual life" is not

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much better because that center is often elsewhere, in a group of scholars working on a problem, in a laboratory where the professor and students are testing a hypothesis, in a group of friends who meet regularly for study and discussion, in a classroom, or even in a student's room or a faculty member's office as he or she reads, thinks, and writes.[2]

In the university or college, libraries are more often viewed, one suspects, as warehouses for the storage of books and other materials, rather than hearts or centers of intellectual activity. And as storehouses, dusty places that one occasionally visits to recover some bit or piece that is useful, they require little more than custodial care. As such, they are not often regarded as a top priority in academic institutions, much less as central to the life of the mind and the educational process. While few librarians would accept the warehouse image, many view their libraries as their particular province. In the warehouse imagery, there clearly is no guide for dynamic library service.

THE BUSINESS MODEL

In order to reconceptualize librarianship for an uncertain future and in the hope of finding a new image, Kaye Gapen suggested using Mary Parker Follet's "Law of the Situation" question: "What business are we really in?"[3] Her response was that libraries have been in the package (book) delivery business. In the future, she says, libraries will be in the information delivery business, a change that will radically alter what librarians do. While the notion of information delivery rather than package delivery serves to enlarge the possible content of that which is delivered and points to the use of modern technologies, it does not indicate a more active role for librarians either in seeking to serve new clientele or in serving present users better, nor does it force librarians into the center of the critical-thinking processes of the university.

Both the question, "What *business?*" and the answer, "Information *delivery,*" smack of mail-order houses, consumerism, profit, efficiency, and popular culture. They make librarians delivery boys or Purolator truck drivers or Federal Express administrators. They transform library users into consumers and books and information into commodities to be used and discarded. All become part of the consumer, disposable society. The result is that the institution that ought to resist the dehumanizing, competitive, degrading aspects of modern culture has ended up adopting the corporate world as its guru. Criticism of the profit-and-loss orientation, of efficiency as a primary value, and of an ends-directed stance is muted or cut off.

Given the business orientation of our culture, it is not surprising that libraries are tempted to look at the corporate model in the search for an energizing, rejuvenating image. Appropriating a new image of librarianship from the world of commerce, however, will only serve, as Parson says, to "fix the limits of the possible."[4] Conceiving of the business of libraries as information delivery will do nothing to redirect librarians' "strict identification with the library as an agency or institution to an identification with the client or library user"[5] because the focus of the business world is on its own survival, not on the enhancement of the quality of life. Furthermore, the business model encourages continuing the old pattern of making the delivery in response to a patron request. The burden for initiating the request, knowing what to ask for, and evaluating the information provided all rests with the patron or, at best, depends upon the library's effectiveness in marketing the products and services *it* chooses. What remains as highest priority is improving the efficiency of the delivery system rather than seeking to understand and meet the needs of the library user.

MISSION AND GOALS

Having no controlling paradigm for guidance and seeking to improve library service, librarians in the last ten years or so have placed greater and greater emphasis upon the need to articulate a clear statement of mission and goals. These often relate to regularly updated, long-range plans. Surely these are needed; no library can function responsibly without them.

The problem, however, is in identifying the library with its mission and goals rather than looking for its intrinsic being or value.

The difficulty with goals is that they are rigid, resistant to change, often self-limiting, and that they focus on the achievements of the person or group articulating the goals—a focus that is isolating and, therefore, grossly inappropriate for defining a service organization. Originating in the self-perceptions of a group, goals tend to promote a competitive stance. The group may see itself as standing against competing groups or institutions, sometimes even those it seeks to serve. A statement of goals has no built-in mechanism for periodic review, criticism, or evolution. When it is adjusted to meet new situations or to take advantage of new technologies, the new set merely takes the place of the old. Worse yet, constantly changing statements of mission or goals lead to a sense of instability, insecurity, and loss of identity. Further, when a library is identified and characterized solely by its goals, it is end-oriented and end-justified. The ends or purposes it serves and how well or how poorly they are met define the institution.

The notion of mission has a problem as well. While a sense of mission is not isolating, as goals are, mission does have an inherently self-referential character that emphasizes the person or group *with* the mission rather than those it wishes to serve. A larger, transcending vision is needed, one that seeks to identify the intrinsic value of libraries in relation to society and one that will continually inform and correct the mission and goals of a library. The conversation model discussed below may supply the dynamic, organic paradigm needed to bring academic libraries into a more intimate relationship with the central concerns of the educational world.

THE CONVERSATION OF A LIBRARY

Libraries, if they are true to their original and intrinsic being, seek primarily to collect people and ideas rather than books and to facilitate conversation among people rather than merely to organize, store, and deliver information. To be sure, libraries have traditionally collected the documents of human imagination and action. In doing so they have preserved the ideas and events of history and have become the centers for ongoing conversations in which people speak their opinions, criticize others', and enlarge or restrict the scope of the discussion. Scholars state their thesis in writing, add information to the topic, argue with each other, and even change the direction of the conversation. The primary task, then, of the academic library is to introduce students to the world of scholarly dialogue that spans both space and time and to provide students with the knowledge and skills they need to tap into conversations on an infinite variety of topics and to participate in the critical inquiry and debate on those issues.

In its earliest meanings conversation meant "living or having one's being in a place or *among* persons, living together, intercourse, society, intimacy, or engagement *with* things in the way of . . . study" as well as the "resulting condition of acquaintance or intimacy with a matter."[6] It had to do with people living with people and sharing intimately their experiences and ideas, their very lives. Conversation was and is an essential activity of human beings and one that informs, critically evaluates, and provides energy and renewal for their life together.

Conversation can be of utmost seriousness as philosophers debate truth, beauty, and justice, world leaders hold a summit meeting, labor and industry meet at the bargaining table, or students prepare for a class session on plate tectonics. Conversation can be purely playful, recreation in the best sense of the word, as friends gather around the fire after a skiing expedition, as the library softball team plans to take on the student intramural champs, or colleagues engage in punning or exchange new jokes. Intercourse, the most intimate expression of communication, wholeness, and integration, reflects the quality and character of conversation, the most general and inclusive activity of human connectedness.

The preservation of crucial conversations, the first task of libraries, served not only to preserve the record, but more importantly to ensure the continuation of significant conversations already in progress. The intrinsic value of libraries, therefore, is not so much lodged in the collection of information as it is in their relational value. Insofar as libraries make intercourse possible among people and even enter into that intercourse themselves, they are true to their original value. Insofar as they serve to bring people into relationship with each other, they are true to their principal purpose. Conversation, essential to the quality of life of Homo sapiens, provides the occasion and mode for intimate, significant, and ongoing engagement of human beings with each other in society. Libraries bear the critical burden of preserving, facilitating, and participating in those conversations.

Paradigmatic of the original and inherent purpose of libraries, conversation appropriated as the controlling image for librarianship can significantly inform the articulation of mission and goals, collection development policies, services, and the role and character of librarians as well as the organizational structures and procedures of libraries. Adopting the conversational mode may, in fact, provide enduring and powerful direction for all aspects of library service and, in emphasizing participation and process over ends, would provide the internal and ongoing mechanism for evolution and change.

Mission and Goals

Adopting the promotion of and participation in conversation as the primary task of libraries suggests that librarians searching for suitable missions and goals in the educational setting return to the old notion of vocation or calling. By thinking about calling, one places the focus outside the library and suggests the need to respond to voices other than the library's own. The library and librarians responding to the call of the educational enterprise immediately find themselves in a dynamic, relational stance, not in a passive, isolated one. Discovering the proper vocation of the library then becomes an ongoing process of conversation with those involved in teaching and learning, in which resolution of differences and refreshment of purposes can occur.

Collection Development and Services

Focusing on the enlargement of conversation in the educational environment demands that librarians ask questions about the needs of faculty and students. Which recorded conversations are needed to support the curriculum of this particular institution? What are the impediments to participation in scholarly discussion? What do students need to assist them in becoming active participants in intellectual dialogue? What library services will encourage faculty and student interaction on significant issues? What are the needs of faculty in pursuing their teaching and research? The answers to such questions concerning collection development and services will necessarily come out of continuing conversation with faculty and students, both individually and in the governance structure of the college. Surely the whole range of possibilities—reference service, database searching, term paper consultations, bibliographic instruction, and, one hopes, new possibilities for services not yet envisioned—will be explored in order to bring about the widest participation in the intellectual inquiry.

Bibliographic Instruction

In the development of citation indexing the conversational paradigm has already influenced entrée to scholarly works. Built on the notion that scholars talk to each other in their writings, citation indexes provide users with access to the contributions of all the participants in a particular discussion through the list of footnotes found in a book or article and through the list of articles and books that subsequently cite the central work.

Pushing the paradigm further, it can significantly inform bibliographic instruction by suggesting that students be invited to discover and participate in discussions that span the globe and the centuries. Using the library, students in the 1980s can enter a dialogue with Plato, Machiavelli,

and Ghandi on the relationship of the individual to the state. They can participate in conversations on world hunger, euthanasia, and drug abuse. Books, journal articles, and other library materials, understood in their original and proper relationship to each other, represent the opinions and arguments in the ongoing conversations on these issues. The aim of bibliographic instruction becomes one of enabling students to be active and critical in the encounter with other minds. The usual student attempt to assemble a collection of "good quotes" and a lengthy list of references will not do. Furthermore, librarians providing instruction cannot be content with teaching library organization and use of library tools.

The questions for a student become Which conversation do I want to enter? Where and how do I find that conversation? Who are the participants in the discussion thus far? Are there disagreements that I need to know about? How do I assess the value and quality of the various contributions to the conversation and can I make a significant comment on the issue or problem? Instruction, therefore, will include analysis of the problem to discover which conversation a student seeks, instruction on where and how to locate what has been said on the topic, and evaluation of the various contributions to the conversation. Clearly, this includes discovering the qualifications of the participants in the discussion and their particular points of view and assessing their value for the student's particular interest or concern. Bibliographic instruction will encourage and assist students to think critically about the search process, teaching them to use the process itself to refine and narrow a topic and to use the results in the development of their own position on the issue. The proper task of bibliographic instruction becomes teaching critical thinking and enabling participation in intellectual inquiry. The focus is on the process of scholarly dialogue, not on the organization of the library or the production of term papers. The result is that the librarians find themselves intimately engaged with students and faculty as they explore what it means to think critically.

Character and Role of Librarians

Appropriate library response to the call of the university to pursue critical thinking requires librarians who are educators—library educators, to be sure, whose special and primary task is to facilitate scholarly conversation in the educational environment. Such a role requires librarians who are or can become library and educational generalists, whose critical facilities can be continually honed and sharpened in the dialogue with faculty and students, who are themselves active in the life of the mind and, above all, who relish analysis and examination of significant issues.

A second master's degree in a subject area taught at the college or university is useful for librarians in demonstrating their ability to participate in significant scholarly conversation. More importantly, however, effective bibliographic instruction can best be provided by one who is active in and excited about his or her own research and writing.

Required also will be primary commitment to the educational process, not to the library as an independent entity. Working with faculty as fully professional partners in the pursuit of learning clearly requires professional commitment that is not restricted to forty hours a week, eleven months a year. Neither striving to become faculty members nor content with being custodians of the library, librarians must primarily be concerned with continually seeking and providing library services that will enhance the educational process, that will enlarge participation in intellectual dialogue.

Organizational Considerations

If librarians are primarily to be promoters of conversation, they must themselves be able to participate fully in the conversations of the library and the university. While it does not dictate any particular form of library organization, providing the context for free and open conversation among the library staff necessarily includes a leveling of hierarchical structures and a loosening of rigid hierarchical control. This is as important for the

growth of the collection and success of the library in meeting the needs of its users as it is for the growth of individual librarians. Creativity, one suspects, most often comes in the interchange between people and not in individual heads thinking in isolation; individual, intellectual, and, therefore, professional growth occurs most significantly in the agora of free and open debate.

In addition to loosening the bonds of traditional library structures, the barriers of narrow specialization within librarianship need to be broken down. The separation of technical services and reference activities may have been effective and efficient in the past. However, the antipathy, jealousy and competition such division fostered between individuals and departments within the library can no longer be tolerated. The explosion of information that is forcing more careful choice of materials for a particular collection and the radically improved organizing and accessing of materials afforded by computers both underscore the fact that the traditional separation of cataloging and reference is artificial. Librarians intimately involved with faculty and students and with each other in planning and executing library services must be active in and knowledgeable about all aspects of library service.

CONCLUSION

The conversational mode, intrinsic to the nature of libraries, may provide the paradigm, context, and impetus needed for reconceptualizing academic librarianship. Committed to bringing together, in conversation and dialogue, voices from the past with those of the present, African voices with Spanish and English, young voices with old, men with women, and librarians with faculty, students, and administrators, the academic library will not only provide access to conversations, but will also continually participate in discussion with those it seeks to serve. The extent of the librarians' task, much like the structure of conversation, is open-ended. There is always a great deal more to do; there is much more to say and many more voices to be heard.

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Funding Online Services from the Materials Budget

Jay Martin Poole and Gloriana St. Clair

During this transitional time of decreasing library budgets and an increasing requirement for online services, it behooves librarians to consider all the possible sources for funding these new and demanded services. The information provided by an online search satisfies legitimate educational and research needs and should be funded with monies from the print materials budget. As automated information services become more prevalent, it is essential that libraries find permanent funding to support this activity.

In 1981 the American Library Association produced a boldly designed and handsomely executed poster showing a stylized American flag with the words *FREE* underneath it. While this poster was a masterpiece of design and in fact extremely effective as a propagandistic tool, its message cannot be interpreted as anything except a well-intentioned departure from the truth. Libraries have never been, nor can they ever be, free. They are expensive to create and maintain, and, as their mission becomes increasingly tied to sophisticated automated systems, so their price escalates.

Since libraries cannot be free, the questions concern who will pay for them, how the appropriated monies will be divided, and which services will be offered from what funds. While libraries are as sacred as motherhood and apple pie to American civilization, their services are in fact targeted at a relatively small percentage of the population. In the case of academic libraries, the services are traditionally restricted to a cleanly defined population.

Libraries have always been faced with the problem of dividing their resources, and at this juncture the difficulty has been exacerbated by decreasing budgets and increasing costs of modern services and materials. The availability of computerized database services for education and research has dropped a new problem into the already complex issue of how to divide a research library's budget. Libraries have responded variously. Since the expenses of an online search are easily measurable, the cost of what has been perceived as a new service has been totally passed on to the user in some cases. Some other libraries have partially underwritten the costs of the searches to various extents. In certain instances online searching has been available without charge. These monies are raided from already strained operating budgets.

LITERATURE REVIEW

The literature contains many articles on charging or not charging for online services in different environments. Fee or free seemed to dominate library literature, especially in the late 1970s. In 1977, the council and membership of the American Library Association passed a resolution asserting that the charging of a fee for information services was discriminatory.[1] More recently, articles continue to appear but offer no specific information about the impact on materials budgets. Suzetta Burrows and August Lahocco, in "Fees for Automated Reference Services in Aca-

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demic Health Science Libraries: No Free Lunches," indicate that ten years after the introduction of Medline, most institutions still charge fees.[2] Carolyn G. Weaver, in "Free Online Reference and Fee-based Online Services: Allies, not Antagonists," weighs the arguments on both sides for publicly supported libraries and suggests a compromise.[3]

In "Free Online Searching in a Public Library System: An Unscientific Study," Georgia Fox Donati and Martha Moss Kreisel describe the implementation of free searching in the Westchester Library System in New York.[4] In "Will Public Libraries be Obsolete in the 1980's," J. William Baker notes the difficulties libraries have in obtaining funds for automated retrieval equipment and the publishers' projections for decreases in book use.[5] John Budd applies the U.S. code on free access to information to this problem in "The Terminal and the Terminus: The Prospect of Free Online Bibliographic Searching."[6]

Carlos A. Cuadra calls online retrieval an equalizer between the information haves and the information have-nots in "Commercially Funded On-line Retrieval Services—Past, Present, and Future."[7] In "Online Services: Beyond Fee or Free," Sara D. Knapp addresses the question of whether three academic libraries should charge users for online searches.[8] In "Free Online Searches are Feasible," Paula J. Crawford and Judith A. Thompson conclude that online services should be free for users in academic and research libraries but do not address the problem of how to fund them beyond a simple statement that "Monies allocated for searches are taken from the budget for supplies and services," to be divided among academic departments based on past demand.[9] Mary Huston in "Fee or Free: The Effect of Charging on Information Demand" also urges alternatives to direct user fees whenever possible.[10] And in "Budgeting to Provide Computer-based Reference Services: A Case Study," Sara D. Knapp and C. James Schmidt discuss costs, planning, organizational, and managerial considerations but do not indicate what part of the budget was used.[11]

Several authors note criteria for dividing library materials budgets. In "A Formula for Allocating Book Funds: The Search for Simplicity and Flexibility," Fabian Ehikamenor demonstrates the use of a well-tested formula for dividing book funds at universities in Nigeria.[12] Stephen Toney notes efficiency improvements from improved knowledge of resource allocations by tagging expenditures with goals in "A Cost Database for Branch Library Resource Allocation and Performance Evaluation."[13] In "Problems and Potentials of Linking Acquisitions and Circulation Systems," Nolan Pope notes possible sources for collection development information and evaluation.[14] Marcia L. Sprules in "Online Bibliometrics in an Academic Library" reports a study of journal usage isolated through computerized databases.[15]

And Rowland Lorimer in "Implications of the New Technologies of Information" argues that despite the inherent biases of new technologies, benefits must be shared all around. He believes that the electronic communications revolution "can exacerbate inequalities of power and concentrate knowledge in the hands of a few."[16] He fears that individuals, corporations, universities, and countries can partake of an unequal power base as easily as they can contribute the establishment of "a global equilibrium in creative intelligence."

RESOLVED

The information provided by an online search satisfies legitimate educational and research needs and should be funded with monies from the print materials budget. This act should not be seen as a final resolution to the problem but rather as a transition measure to be used until libraries can establish the efficacy of this expenditure, justify it to their funding agencies, and acquire permanent funding designated for this use.

Historically libraries have spent millions of dollars to buy print materials. The conjunction of selection and acquisition is that materials monies are inevitably spent, to a greater or lesser extent, on a "probable need" principle. While librarians have studied their patterns of buying with all the statistical tools known, the continuing result is that many purchases of books are

professional hypotheses on the part of the librarian. From a penchant for statistics, librarians know that a very small percentage of the books bought serve the major portion of user needs.

Naturally some decisions to purchase are more precise than others. When a professor requests supplementary reserve-room reading materials for a large lecture course, the probablility is high that the print materials will at least have the appearance of being used.

Approval plans, which allow libraries to establish a pattern of needs, provide a more codified type of planning. The tremendous savings they offer by lowering selection and acquisition costs without apparently degrading selection quality make them attractive to institutions already under budgetary strain.

Collection development and management involve careful studies of the strengths and weaknesses of the collection as it complements the curriculum of the institution. Still, no matter how carefully constructed the procedure, the collection manager is always attempting to anticipate the needs of the user.

A collection's lack of use is rationalized by the idea that the material may be used in the future. If this future use does not materialize in the short term, the materials may be used for research purposes at some far-removed occasion. As a consequence, storage facilities are constructed to house materials of possible historical interest, and librarians agonize over their archival functions.

The knowledge and experience that librarians have brought to the process of selection has resulted in collections that fulfill user demands. However, librarians must accept the fact that many materials purchased are infrequently if ever used.

The summation of this perplexity of selection and acquisition is that the "probable need" principle dominates spending of materials monies. An element of contingency persists in collection building.

In fact, libraries have always spent large portions of their budgets on processing and analyzing materials to make them accessible. The costs of materials selection, acquisition, cataloging, and processing have always been considered essential. To collect and store the materials without analyzing their contents and providing access has never been a research library alternative. Only recently, with the advent of Robinson-style libraries, have a few public librarians accepted this as an alternative.[17]

Spending monies for access to materials is a traditional, in fact, essential, library practice. Large chunks of materials monies cannot be accommodated without at least equal funds for acquisitions and cataloging.[18] More and more frequently, libraries have recognized the extent of these added costs and begun to request them in budget justifications and grant proposals.

Thus, access and materials are integral to the user's relationship to the library. The relative amounts of money spent on them, while technically divided in the library's budget, are not separable. Monies taken from the service budget impact on the amount available for the materials budget. The natural outgrowth of the realization that comparable amounts of money must be spent on access leads to an acceptance of online access as an interim materials expenditure.

The access provided by online searching is as legitimate a use of funds as that provided by the processing of materials. Indeed the precise and careful construction of online searching is an efficient use of funds for providing access. "When we do an online search, it is tailor-made for someone. . . . It is not like a book, which we buy for everyone to use," says Suzanne H. Gallup in "Computerized Data-Base Services for Research Bring Era of 'Free' Library Service to End."[19] Since the search is precisely defined, the probability of its being used is insured. Consequently, the tailor-made use of the funds provides users with the beginnings of a solution to their research problems. Further, libraries have always bought books and serials for one faculty member or student to use, even though these items were inevitably added to the collection.

Funding the online search from the materials budget should proceed in a rather inevitable fashion. First, only a few journals and newsletters are now published in online format. The library should perceive this as a natural expenditure of its materi-

als budget, for in fact, no alternative will be available. Also, data services, such as I.P. Sharpe Associates' numeric databases and Develop (Control Data Corporation), have already begun this trend. No administration, internal or external, could question this use of funds.

The next legitimate step would be to provide monies for online indexing and abstracting services that are also published in paper format. This step would require careful control of public relations propaganda and would necessitate monitoring of downtime, dirty data, and other substantive issues. After suitable periods of adjustment, the paper indexes will be foregone in favor of expenditures for their online alternatives. As technologies evolve, citations and abstracts should be supplemented by full text. Libraries should be given downloading options, either for the entire full-text contents or for only those particular items requested by patrons. The earlier selection choice is now more certain, for the user's need is expressed before it is met. Future needs will be consigned to large repositories, probably divided among concerned libraries.

While the first movers in this area may be large, specialized, highly scientific and technical publishers, more ephemeral materials such as corporate newsletters and in-house "rags" may cease to appear in paper format. The growing ubiquity of this online trend will make it easier for libraries to justify their use of materials monies to support online searching.

IMPLICATIONS

The implications of funding online searches from the materials budget are not trivial. Cost containment would be essential. Scheduling changes and library networking could be considered to reduce telecommunications and other costs. Fiber optics and satellites may afford some relief from rising telephone expenditures.

An intriguing switch on traditional philosophy might invite some courageous library to experiment with providing no-charge searches and charging for the use of the books and journals. Flat user fees or library fees, like laboratory fees, might also be ventured.

Libraries should aim for total funding. However, it might be necessary to set a limit on what percentage of a materials budget would be allocated for online searching and to determine how the services might be most equitably distributed among the library's users. For instance, nighttime use of inexpensive databases might be made available for all; slightly more sophisticated searching might be funded for graduate students and faculty (with stated limitations). In an address to the Acquisitions Roundtable of the Texas Library Association, Glyn Evans mentioned that he finds a maximum 10 percent rule of thumb useful for the State University of New York systems.[20]

Depending on the size of the library and the nature of the research problem, the users may then proceed to finish their research within their own library or they may be guided into the use of interlibrary loan services to meet their now established needs.

Thus, the library must plan for an increase in its interlibrary loan traffic because of the breadth and sophistication of the data retrieved. Staffing must be adequate and the fee monies available.

The balance among the disciplines in the university's curriculum must also be guarded. Because industry uses them, scientific, technological, and business databases tend to be more highly priced than those in the humanities and arts. The library should mediate to maintain balance, but each involved department should also be aggressive on its own behalf. Everybody in social sciences, humanities, and arts must press for the use of databases and must become familiar with the advantages of the technologies involved.

One other caution seems necessary. J. Bronowski says in *The Ascent of Man:*

> Johnny Von Neumann was in love with the aristocracy of intellect. And that is a belief which can only destroy the civilization that we know. If we are anything, we must be a democracy of the intellect. We must not perish by the distance between people and government, between people and the power, by which Babylon and Egypt and Rome failed. And that distance can only be conflated, can be closed, if knowledge sits in the homes and heads of people with no ambition to control others, and not up in the isolated seats of power.[21]

Echoed by many concerned citizens, Bronowski compels librarians to provide equal and effective access to all regardless of the source of funding.

Funding of online searching from the materials budget should be offered as an interim measure. If funded searching succeeds in increasing user satisfaction, the case must be made for separate permanent funding in the future.

In the long range, budgets need to be supplemented to provide for the kind of superior library service now available. Using the materials budget in the interim should allow a library time to gather sufficient data and to gain significant faculty and student support. Then, administrators should be prepared to go to suitable sources and return with adequate funding.

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Reactions to "Funding Online Services from the Materials Budget"

Sheila Dowd, John H. Whaley, Jr., and Marcia Pankake

REACTION FROM SHEILA DOWD

"Then you should say what you mean," the March Hare went on.

"I do," Alice hastily replied; "at least—at least I mean what I say—that's the same thing, you know."

"Not the same thing a bit!" said the Hatter. "Why, you might just as well say that 'I see what I eat' is the same thing as 'I eat what I see'!"

"You might as well say," added the March Hare, "that 'I like what I get' is the same thing as 'I get what I like'!"

The wisdom of Wonderland often seems to address our daily problems; and here I find it applicable to the questions Jay Poole and Gloriana St. Clair have raised. Every library must define its mission, and allocate its available funds for the best accomplishment of that mission. The mission of the academic research library is, as Poole and St. Clair acknowledge, complex; it encompasses the systematic development of collections of scholarly resources, and the provision of services to make those resources available to users of varying degrees of sophistication. The nature of both the collections and the services are changing, and will continue to change with the emergence of new information technologies; but for their own understanding and their accountability to clients and funding sources, library managers must resist the temptation to confuse the two, to blur distinctions and aver that collections and services are the same thing.

At this point it may be well to interject a reminder that the authors themselves have focused this debate on the academic research library and to concede immediately that the question may be irrelevant for those special, public, and college libraries that define their missions entirely in terms of provision of services. The research library is committed to preserving the human record as a resource for scholars now and for future scholarship. The form of that record may change and is changing, but the collection function of the library entails the responsibility to provide information (and its distillation, knowledge, which, as Daniel Boorstin has noted, is orderly and cumulative where information is random and miscellaneous)[1] for generations of scholars. Thus, for the research library, the principle of building for "probable need" while continuing to address present demand is the essence of the mission and of the challenge. If the book budgets of libraries were limitless or even very generous, the assessment of "probable need" could lead to an inundation of materials, the "vacuum cleaner" approach to collecting. But

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in fact most collection development librarians are hard pressed to acquire, in sufficient numbers, the works needed for curricular support and for very active research fields and at the same time to anticipate the needs, not of one hundred years hence, but of tomorrow's changing or emerging disciplines. One of the most demanding, skilled, and risky roles in a research library is the role of the selector in anticipating "probable need."

For a research library to attach a higher value to the immediate satisfaction of one patron via an online search than to the development of collections intended to meet the probable needs of changing disciplines and interdisciplinary areas would be regrettable. Conceptually such a value system could be equated with prizing the availability of abundant reserve copies above the creation of a collection reflecting a broad and balanced array of titles. Both activities represent important aspects of the library's mission; but one relates to the library as a service organization, the other to the library as a long-lived resource.

One can no longer define the building of collections as the amassing of printed sources or even as the acquiring of physical information packages in any form. A "subscription" today may be a fee to a database owner permitting the library to access the files, and, as our authors point out, a journal is no less an important scholarly resource for being published electronically. They are right, too, in suggesting that online indexing will to a considerable extent replace printed indexes as user access systems improve and personal computers proliferate (although most busy reference librarians would tell them that heavy volume of use is still, in the present stage of the technological revolution, best accommodated with the printed index). Where an electronic database does substitute for a printed index, there will be a transfer of costs that certainly must be recognized in budget allocation. What, then, should determine whether an online database cost is properly a collections or a services charge?

The elements of online information services that seem to me to be chargeable to the materials budget are those that provide—whether by purchase, subscription, or contract access—an information resource for the library's entire clientele, or a substantial segment of it. These charges will result in information in electronic mode being equally available to a broad range of library users. The additional costs that may attach to an individual's use of the online service, such as connect costs and database citation charges—that is, those costs that provide service to one individual without providing for any continuing accessibility of the database—are properly considered an element of the library's service function. Poole and St. Clair make the valid point that online indexing may reduce the library's need to process some materials exhaustively in-house. This suggests that the technical services budget too (and the automation budget) should be reviewed when the library is trying to reallocate its funds for the support of online database access.

Subscriptions to electronic journals, then, are a materials budget item; so are subscriptions to online indexes. Purchase of publications on disk or tape are certainly materials acquisitions. One might extend the question further, and add that cooperative purchase of material to be housed elsewhere, in any form, is also an appropriate charge to the materials budget, and hence, at least part of the membership fees in an organization like the Center for Research Libraries, which extends the library's resources through shared ownership, are legitimately chargeable to the materials budget. Fees for interlibrary loan, on the other hand, are, like online connect charges, costs that benefit only one user. They should be treated as part of the library's user services costs.

The authors rightly say that the emergence of computerized access sources has created new costs and additional problems in library budgeting. They speak of libraries that have attempted to meet these costs with "monies raided from already strained operating budgets," and they acknowledge that the final resolution to the problem will be justification to funding agencies of online search costs and acqui-

sition of permanent funding designated for this use. What they fail to recognize is the fact that their proposed "transition measure" is another form of raid on those strained operating budgets. What is the book budget if not a key element in the library's cost of doing business?

Many of us still believe that citizens are entitled to free access to information and that society has both the duty and the power to provide it. Adequate library support for that goal will not be more readily obtained by absorbing or disguising our needs. The cost of user access to databases *is*, in the complex of demands associated with the mission of research libraries, a new cost. The pressure for acquisition of publications has not diminished with the new services; indeed, in most libraries demand for publications increases as treasures are unveiled in Dialog or Medline. Demands for the so-called "traditional" library services (and how radically they have changed!) are also increased by the new service capability: more interlibrary loan, more (and more complex) library use instruction, etc. We must recognize that online search services represent competing costs. We must recognize too that they are increasingly vital elements of good library service. We must soberly assess the financial support required to perform our whole mission—the creation of permanent information resources and the provision of efficient access services, and we must convince our funding sources of the urgency of our needs. For a "transition measure" our only choice is to look at the library's total available funds and decide what priority can be assigned to this new need among competitive needs.

The goal of "a democracy of the intellect" is a very difficult and noble one. I take comfort in the thought that there has never been a society more capable of attaining it, if we have the will. To work toward that goal is the first obligation of librarians, and the foundation for that work must be built on a clear, responsible assessment of needs and costs. Let's start by saying what we mean.

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REACTION FROM JOHN H. WHALEY, JR.

Reduced to the bare essentials, the argument outlined by Jay Poole and Gloriana St. Clair is as follows. Traditionally, libraries have chosen to provide "free" access. Since libraries do not charge, we need to determine which funds at the libraries' disposal will pay for the various services. These services include access to information via the acquisition and processing of materials. Online searching provides a type of access to information—one whose costs are measurable. Since libraries do not charge users for access to traditional formats, they should not charge for access to electronic formats. The authors take the position that online searching should be paid for from the materials budget, and they give reasons to support that stand.

Proposition one—Expenditures for online searches are a clearly identifiable use of the library's funds to support educational and research needs. The purchase of traditional materials represents an investment based principally on guesswork or, as the authors define it, a "probable need." As numerous studies have shown, many titles receive little or no use. Robert Broadus refers to "miles and miles of unread books." The acquisition of these materials results in a warehousing problem that leads ultimately to additional expenditures for storage. The authors argue that since the purchase of materials usually reflects little more than an educated guess on potential use, and that guessing wrong incurs other penalties (long-term storage), a more rational use of the funds would be the purchase of a service of unquestioned educational and research value. For each dollar spent funding online services we would see a defined amount of information provided and used.

Proposition two—"Libraries have always spent large portions of their budgets on processing and analyzing their materials to make them accessible." If we now spend large sums on acquiring, cataloging, and processing to make information

accessible, why are we not willing to acknowledge that it is equally reasonable to spend library monies on online searching? "The access provided by online searching is as legitimate a use of funds as the access provided by the processing of materials."

Proposition three—The materials budget should pay for online searching. Already some materials are "published" only in the online format. Will libraries choose not to make this information available simply because it is not published in the traditional mode? Obviously not, since "no administration, internal or external, could question this use of funds."

Proposition four—Having accepted the inevitability of purchasing some "materials" in an online format, libraries should realize the clear advantage of providing the online alternative to some published materials (indexing and abstracting services). In time, full-text downloading will provide a substitute for traditional materials and all guesswork on meeting user needs will disappear, since information would be supplied only on demand. We will have completed the transition from providing information through the purchase of materials to providing information through the purchase of access to databases.

The latter part of the paper treats the implications of funding online searches from the materials budget. Questions related to telecommunications costs; variable distribution of the service to the library's users, by status (undergraduate, graduate, and faculty) and by subject areas (humanities, arts, social sciences, etc.); and possible impact on interlibrary lending are mentioned but not explored in depth. Curiously the authors say nothing about the implications of their proposal on library collections.

For all of the above reasons the authors conclude that the library should bear the cost of the online searches and that the cost should be absorbed by the materials budget.

Now let us examine the first part of the proposal: the library should assume the cost of online searches.

The authors state that "since the expenses of an online search are easily measurable, the cost of what has been perceived as a new service has been totally passed on to the user in some cases." What are the components of this cost? The most obvious are the charges for access to the database and for telecommunications and prints, online or batched. Less obvious, but no less real, is the overhead accounted for by the equipment, searcher time, manuals, training workshops, and facilities. No library passes along these latter costs to the consumer because the price would be raised so high that demand for the service would probably disappear. It could be argued that the real expense in the online search is the time of the professionals who prepare and conduct it. This is particularly evident with the less expensive databases such as ERIC and Medline. Thus, even when the library levies a charge for the service, the full cost is not passed on to the user.

To support their contention that libraries should pay for the full cost of searching, the authors draw a parallel between materials processing and online searches. Both are said to facilitate access to information. While it is true that libraries spend large amounts on processing, the money is invested in materials that the library owns and makes available to anyone who needs them. The book on the shelf is there for any user no matter how serious or frivolous the need.

The online search of necessity discriminates against some users, since not all needs are equivalent. Even the most ardent proponent of "free" searches recognizes that there must be some limits imposed. No matter how well reasoned or justified, the limitation will necessarily exclude someone from the benefits of online searching. "It is not like a book, which we buy for everyone to use." Instead we have bought for some privileged users information that, because it is tailor-made, is unlikely to have equal value for other users.

The authors state that the cost of database searching should be borne by the materials budget.

Traditionally we have identified two large components of the budget: materials and operating. Materials budgets pay for tangible items (books, journals, and

fiche), while operating budgets pay for the costs associated with making materials available to patrons. The introduction of information in new formats arising from advances in technology has created a problem for traditional budget concepts. The information is no longer tangible; that is, there is no "material" for the library to own. Rather, it is in a database that can be accessed by a computer. Therefore, when the information is provided as a printout, the user owns the tangible product. Since the search strategy was designed specifically for that user, the printout of citations is not likely to have value for another researcher. Unlike the book, where multiple uses are possible, the printout is a one-time-use item.

The weakest part of the argument advanced by the authors is that the materials budget should accommodate the expense of online searching. As they have noted, making materials accessible is a legitimate expense, but usually this cost is associated with the operating budget. While the product of an online search may be construed as a "material," the process of conducting the search, including the development of the search strategy and the online interaction with the database, cannot.

Demonstrating the flaws in our selection of print materials does not provide sufficient rationale for using the materials budget to fund online searching. Without convincing evidence that print materials can be justifiably equated with online searches, we must conclude that the materials budget is used because operating-expense funds are already strained to the limit. This strain has been caused by computer technology, the very technology that the authors wish to make more accessible to the public. The automation of library operations is the new bottomless pit and consumes increasingly greater amounts of the operating dollars. The materials budget is attractive because it has more uncommitted dollars available to fund online searching.

As noted earlier, the authors' discussion omits possible consequences for the collections. Will gaps occur in the collection if funds are diverted to support other services? Something will have to be sacrificed. What areas of the collection should bear the cost?

I would argue that the appropriate target should be the reference materials budget: reference items have a high cost per unit; a significant number of them is seldom if ever used. Of those titles frequently consulted, many are regularly superseded and relegated to the general stacks, where they usually collect dust. As the authors note, the paper copies of indexing and abstracting services are often available online; other types of reference material are also being offered electronically. In this format the user has the advantage of currency and greater flexibility in the construction of retrieval terms—they are superior reference tools. As our users become more computer-literate and vendors become more concerned with simplifying access, we should move toward increasingly greater end user service concepts. The skill of the professional searcher should be reserved for complex research problems.

In shifting funds normally expended for reference materials to online searching we must be careful to avoid the temptation to increase the budget for reference materials as an offset to accommodate the new expense. Those who develop reference collections will have to make hard choices between providing reference-type information in traditional or electronic formats. But at least a choice is possible. If we draw online funding from the materials budget at large, the issue is not the substitution of one format for another. Instead, it is the sacrifice of one type of information for another. That is a choice we cannot and should not make.

REACTION FROM MARCIA PANKAKE

What do we mean when we talk about online services: a subscription to or a lease fee for a database, the connect time to search the data, the fee per citation, purchase or lease of a database on CD-ROM, the search manual, the equipment, or the training workshops? How much of this is paid for by the library budget? How much of this should come, temporarily or indefinitely, from the acquisitions budget? Per-

haps another perspective on kinds and purposes of permanent and transitory information sources and on library budgets may better illuminate the budgeting question and aid libraries in their goal of facilitating the "democracy of the intellect."

Few question the legitimacy of online access to information or the utility of customized database searches for ready-reference facts, lengthy bibliographies, or other information. This function has expanded rapidly in libraries, and demand will continue to grow. But to suggest funding such services from the acquisitions budget implies that they compete with or replace books, serials, and other forms of information. Perhaps the hidden reason for funding online services from the acquisitions budget is that it is always vulnerable. It is an easier target to raid than other parts of the budget, such as those designated for personnel or supplies, in which the staff have vested interests.

We should not decide how to fund online services on the basis of an ill-defined, all-inclusive concept of information. Librarians should acknowledge the varieties and distinctive qualities and uses of different forms of information. Print and electronic media are not interchangeable. They serve different purposes; they have different qualities and characteristics; and librarians should think very carefully about their distinctive functions rather than obscure these differences by lumping all "information" together. Some of these different qualities affect the use of information, for example, the display features—in which the form of the data presentation influences the speed and accuracy of its use, as Tom Norton says when he refers to "the democracy of the printed word" and calls the printed page "a technology ahead of its time."[1]

Other external factors such as the rapidly changing fee structure for electronic sources, or the power held by those who control the computerized information retrieval systems, may make librarians think carefully about how they use and eventually may rely on these sources and how they justify their funding. Some information scientists suggest that machine-readable information products "pose a threat to the existence of printed information products" because publishers have not found the right pricing structure for these products, and so the industry is still very unstable."[2]

Online information may not be more economical than print. A printed bibliography or index may be more efficient and cost-effective because it can be used by more than one patron, unlike the individually tailored list of references produced on demand. A book can be used repeatedly and successively and, some argue, at little cost after the first use.[3]

Neither should we justify funding online sources on the basis of the online product's presumed superior utility. Utility is relative to need, and we still know too little about measures and values of utility. The fact that a book or serial is bought at the request of one faculty member or student does not preclude later uses by others, and indeed, the "laws" of sociobiliometrics suggest the opposite.[4] Jay Poole and Gloriana St. Clair suggest that the purchase of books and other library material is based on speculation, while database searching is not, and that because a search "is precisely defined, the probability of its being used is insured." Thus, presumably, funding database searches may be a "better" use of the acquisitions funds. When, however, is probability ever certain? Just because a search is requested by a patron, or discussed between the patron and the searcher so that it may be "tailored" to a particular need, it does not follow that the search results will be used. Even if every citation is within the scope, the patron may receive the search results and do nothing with them regardless of who has paid. The patron may give up on, lose interest in, or run out of time for the project. Or the search may have provided redundant citations that the patron had identified previously. These duplicate citations are of no use to the patron, but they have cost money. For many reasons, such as unavailability of materials in the library or slowness of interlibrary loan, the patron may not read all the valid sources provided by the online search. The unread citations represent

lack of use.

Nor should the funding case be argued on the basis of access. The person who unlocks the front door of the library in the morning is providing "access" to information, but no one argues that this activity should be paid for from the acquisitions budget. Whether or not the library underwrites online searches for individuals wholly or partly (and most libraries seem to, in that they absorb the charges for staff time, office space, heat and light), there should be a separate budget to support this service, just as a separate budget should support the "access to information" provided by cataloging, acquisitions, circulation, reference, or interlibrary loan.

The online search may provide access to information, but this information is not added to the stock from which everyone can draw. It is supplied solely to the individual, much like that supplied by reference staff in person or by telephone. Do libraries pay for telephone calls from the book budget?

What the institution buys and the library provides when a printed work is added to the collection is durable information, available to everyone for as long as necessary. Unlike the results of the online search, the reference book represents a permanent addition to the material or capital stock of the library, and the acquisitions budget identifies this portion of the institution's investment. Commercially produced, machine-readable information, which becomes the property of the library, is another expense that may suitably fall under the acquisitions budget.

When custom-made bibliographies or information searches are created and given to individual patrons, this information does not become part of the common property. It does not contribute to a democracy of the intellect in the same way as bound volumes that can be read by anyone. As unique items, the printouts of online searches bear more resemblance to the manuscript painstakingly copied by a monk for a wealthy patron. The *democracy* of the intellect requires enduring materials available to all, rather than consumable transitory printouts made for private personal consumption or electronic journals available only to individuals with computers, who have no interest in whether the information will be available indefinitely. Certainly we need the latter to stimulate and further the advance of knowledge, but this advance should not come at the direct expense of materials available to any or all users. Librarians must provide the proper mix of media for their patrons and balance print and electronic forms just as they balance other services.

The qualities of malleability, instantaneous change, and potential transience of information in some online databases justify their separation from print materials in the library's budget. As Gordon Neavill has pointed out, the stock of knowledge in the library depends on information recorded in tangible form.[5] It is libraries, not for-profit vendors, who maintain the availability of information that commercial vendors may find unprofitable: scientific and scholarly information in little or no demand; nonscholarly writings no longer in demand; and noncurrent data purged from updated reference works.

The library budget is both a planning and an operating tool.[6] One half of budgeting is to get the largest possible amount of money; the other half is to spend that money effectively. The budget should be seen as the tool to seek additional funds to support new services, rather than as yesterday's leftover pie to be divided into smaller and smaller pieces.

Librarians who want to provide vigorous online information services should do it right. The proposal by Poole and St. Clair is a halfway measure to build up the online services. Shouldn't the library instead create a new budget for online services, in order to emphasize this new development? Wouldn't it be better to plan intelligently than to take the easy way out by skimming money off the acquisitions budget? Construct an online services budget that will allow not only for the direct search costs (whether or not any part of these are passed on to the patron) but also for other needs: reference tools like database directories, search manuals, publicity, demonstration searches, ab-

sorbing of mistakes, training sessions and other costs.

Administrators of institutions often seem to have a preference for funding new or innovative programs. Thus it may be easier to obtain new money for the online service than additional money for an older library operation, and to get this money when the service is new, rather than after it has become entrenched and is regarded as something the library always has done and ought to support without any additional financial help. This strategy may allow online services to compete for money, not internally with books and serials, but externally with other computer services.

One size never fits all, and one recommendation can not apply to all libraries. Some libraries undoubtedly fund online searches from the acquisitions budget. Of course, the budget structure depends on the size and nature of the library. Still, for libraries with large or long-term collections, it seems better not to mix up notions of information, utility, and access with the recognition of expenditures for capital expenses and tangible assets. When online searches are a service, they should be funded as a service. This budgeting allows the library to offer the newest forms of information without weakening the other more solid media through which the democracy of the printed word endures.

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Underground Libraries

Rolf Fuhlrott

A number of underground buildings have been constructed during the last two decades, for various reasons: energy conservation, density in the environment of the crowded cities, or preservation of the landscape and historic buildings. Some libraries have also been built below grade. This paper begins with some general remarks on underground buildings followed by the advantages and disadvantages of this new building type. The main part deals with underground libraries, built mainly in the United States, illustrated with photographs and floor plans.

Many underground buildings have been constructed during the past two decades.[1] The reasons are varied: increased efficiency of land use in crowded cities, preservation of open spaces and historic buildings, and energy conservation.

In the recent past certain functions, as a matter of course, were burrowed into the earth, for example, public utilities, technical building equipment, and transport facilities. With the construction of parking garages under squares or beneath municipal parks, new possibilities were offered to town planners. Because a variety of benefits accrue, various types of buildings are now constructed underground. Even library buildings, most of them in the United States, have been built below grade.[2]

TYPES OF UNDERGROUND SPACE

Many types of underground space exist. They have widely varying characteristics.[3] One distinction is between mined space and earth-sheltered space. Mined space is usually deeper and thus more isolated from the surface. Mined space has limited points of access: either vertical shafts or horizontal tunnels. Earth-sheltered buildings are built into the soil by surface excavation.

Beyond the general classification of deep-mined and near-surface space, underground buildings can be characterized by their relationship to the surface. Thus, we find subgrade structures totally below grade and invisible, and bermed structures with the floor level only slightly below grade and with earth built up around the buildings, both on the roof and walls. Another type of structure is set into sloping hillside sites, often with on-grade access. In most cases, the berms are used as architectural forms. Examples range from small housing structures to very large multiuse buildings, as well as libraries.

SOME ADVANTAGES

The fact that underground space provides a degree of isolation from the surface results in a number of benefits for the surface environment as well as for the activities placed underground. Often, an underground building is an appropriate solution for an area with a historical character in which an above-grade structure would be disruptive. This is true on many university campuses where it is important to preserve a quadrangle, square, or mall, for example, Harvard, Yale, or the University of Michigan (Ann Arbor) in the United States; the University of British Columbia in Vancouver, Canada, and the University

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of Stellenbosch in South Africa.

In other cases an underground building can preserve the character of sensitive sites where the intrusion of manmade structures may be undesirable, such as Cornell and Princeton universities and Hendrix College (Conway, Arkansas).

By placing a building below grade, the roof can serve as a parking lot or plaza. This is important in built-up areas, for example, the University of Illinois campus at Champaign-Urbana, or in such urban sites as the Walker Community Library in Minneapolis, Minnesota, where it is desirable to preserve open space.

Subsurface structures have some characteristics that contribute to energy efficiency. The greater the percentage or surface area in contact with the earth, the more the structure will benefit, because infiltration is eliminated. This results in both heating and cooling load reduction.

In many climates, the temperature of underground structures may be low. When low or moderate occupancy levels permit, lower temperatures may be appropriate for certain functions, for example, archives and book stacks, where cold storage is good for the stored materials. This technique has been used successfully, for example, in the storage library of the Polytechnic in Zurich, Switzerland.

Of course, when the occupancy of a building grows, it becomes necessary to heat the building within the limits of human comfort. In these cases, it is easy to transfer the existing heat from outside into the underground space. The large mass of earth surrounding the structure modifies the effect of rapid fluctuations in outdoor temperature. Typical day–night or seasonal temperature swings are absent, peak loads are reduced, and the temperature will generally approximate the annual average. This results in smaller requirements for heating and cooling equipment.

Because underground buildings are constructed of long-life materials, primarily concrete, it is assumed that they have a longer life cycle than conventional structures. Another factor contributing to their durability is their protection from temperature variations, freeze-thaw cycles, and winds that damage the roofs and facades of many above-grade buildings.

SOME DISADVANTAGES

Some of the greatest drawbacks to the use of underground space are not physical or technical in nature, but psychological. However, negative reactions usually diminish or disappear once a well-designed project is in use. Nevertheless, there is a wide range of disadvantages that must be overcome.

One is the lack of natural light and windows providing an outside view. Of course, this is acceptable when the structure is used for stack space and other low-occupancy functions. In other cases, these problems may be partially overcome by the use of sunken courts, skylights, and other openings to the surface.

Access to underground space is a principal factor in its acceptance. Acceptance of underground buildings is most easily achieved in bermed buildings or those set into sloping sites where direct horizontal entrance from the outside can be provided, such as Bristol, Pennsylvania, public library, Vail (Colorado) Public Library or Saint Meinrad (Indiana) Archabbey Library. For spaces that are not fully below grade, ramps, stairs, and escalators or tunnels from the basements of adjacent buildings can provide access.

Below-grade buildings generally have greater potential for water leakage than above-grade structures. Because the costs associated with water-damage repair are quite high, it is necessary to plan carefully and select a good quality waterproofing system. Such systems will be more expensive for underground than for aboveground structures.

An indoor water problem can be caused by condensation. Condensation on indoor surfaces may occur because the surrounding earth is generally cooler than the indoor air temperature. This situation can be prevented by adequate insulation or mechanical dehumidification.

SOME PSYCHOLOGICAL CONSIDERATIONS

The lack of natural light is one of the most frequently criticized characteristics

of underground space. The difficulty of orientation in windowless rooms can result in a number of negative psychological reactions. However, through the use of sloping sites, courtyards, or skylights, natural light and an exterior view often can be provided.

Negative reactions to windowless space appear related to a fear of structural collapse and subsequent burial, or a fear of being trapped in windowless buildings. Closely related to the general fear of being underground is claustrophobia, the fear of small, enclosed spaces with limited escape routes. These fears may be exacerbated in spaces that are not only windowless, but noiseless. A totally silent environment may be unnerving and cause a concern for privacy in conversations.

SOME DESIGN CONSIDERATIONS

Many of these negative effects may be compensated for through proper design. Greater advantage may be obtained if the structure is not placed completely below grade. Through cuts into sloping sites at Cornell, Saint Meinrad, and Vail, and through the construction of above-ground superstructures at Bristol and the University of Illinois it has been possible to highlight the entrance and provide openings for natural light.

A site with sufficient slope provides design opportunities not available on a flat site. Thus, very often a portion of a building is placed above ground with earth bermed around it. Of course, berms represent an additional object on the landscape and diminish the unobtrustiveness of the structure (Hendrix, Harvard). When a building is partially exposed, the berms and extensive landscaping can be used to create forms on the site that draw attention. If the building is placed completely beneath the surface there is the need for a clear understanding of the building size (University of Michigan, for example), location, and entry. Sometimes a plaza, forming the roof of an underground structure, can define the underground building as at Walker Library in Minneapolis. In a more open site, these aims are usually best accomplished by the use of grade changes, such as at Harvard, paving patterns, trees, shrubs and variations in groundcover, along with retaining walls and other elements as at Stellenbosch and the University of Illinois.

The manner in which an underground structure may be entered can have an important influence on the user's perception of the building. The entrance, serving as the transition from the exterior to the interior, is a key element in orienting and directing people to the functional spaces inside. Viewed from the exterior, the entrance may be the dominant image of a building. In order to minimize negative reactions, entrances may be created that are similar to those in conventional above-grade constructions (Bristol, Walker, University of Illinois). This may involve designing an entrance at existing grade that does not require descending stairs. In many instances, underground structures are additions to existing above-grade buildings. Here, some of these entry design problems are minimized, because the main entrance occurs through the conventional building (University of Michigan, UCLA, Oxford, Yale).

The entry often serves as a major area for the provision of natural light and exterior view. The degree to which this is necessary or even desirable depends upon the specific function of the building. The techniques selected for introducing natural light and view are influenced not only by functional space needs, but also by the site and the size of the structure. On a sloping site, conventional vertical glazing can be used for the spaces on one side of the building (Cornell). If earth berms are placed around a structure on a flat site, conventional vertical glazing can be provided on the building's perimeter by creating openings in the berms (Harvard). Natural light and view can be provided through the creation of courtyards (Harvard, University of Illinois). Skylights are a common means of introducing natural light on flat sites (Stellenbosch). But skylights alone may not be an adequate substitute for conventional windows.

In recent years, novel techniques have been developed to provide or enhance the effect of natural light and view in underground structures. Mirrors may be used to

reflect light into spaces not immediately adjacent to exterior openings (Walker Library). Another, perhaps less satisfactory, approach is to provide an exterior view by using mirrors or lenses in a manner similar to that of a periscope (University of Michigan). These various optical techniques, however mechanistic, do permit greater design flexibility in underground structures.

In addition to the normal concern for creating attractive interior environments, special attention must be paid to offsetting the patently negative psychological effects of underground structures. A number of techniques are used to provide visual stimuli and create a feeling of spaciousness. Wider corridors and higher than usual ceilings, together with open-plan layouts using low or glass partitions, are simple means of creating the impression of space. Even more effective is the use of large, multilevel central spaces or atriums. Balconies that overlook large open spaces can diminish the sensation of being below grade (University of Michigan). These techniques also give users points of reference to help offset disorientation (Stellenbosch). In buildings with interior courtyards or central spaces, planters and fountains can create the impression of being out-of-doors.

EXAMPLES OF UNDERGROUND LIBRARIES

Burying library buildings below grade was not a sudden innovation, but a slow development. First, stacks were placed in basement areas. Later, below-grade floors were added. This aim was best accomplished by using grade changes and building wings as at the Firestone Library of Princeton in 1949.

In the early sixties, three libraries placed primary functional areas below grade. In 1962, half of the space devoted to public services at the John M. Olin Library, Washington University, St. Louis, Missouri, was relocated in two underground levels.[4] An atrium placed near the front of the building provides exterior light to the reading rooms. This atrium is regarded as an excellent example of the merging of beauty and utility.

This example was followed in 1963 by the Beinecke Rare Book and Manuscript Library at Yale.[5] The Beinecke Library, on the southwest corner of the historical Hewitt Quadrangle, was built on the last piece of uncommitted ground in the central area of the university. The existing quadrangle restricted the mass of the building that the architects, Skidmore, Owings and Merrill, might construct at this location. The architects also faced the problem of excluding sunlight and controlling temperature and humidity to protect the rare books to be stored in the structure. This problem was solved by burying the library two levels below grade, leaving only the well-known exhibition hall above ground.

A paved plaza connects all surrounding buildings. The control desk, catalogs, technical service areas, and a reading room are clustered around a sunken court on the main lower level. Two tunnels connect these spaces with the Sterling Memorial Library and the Law Library.

The third major underground library construction project of the sixties, the Eisenhower Library at Johns Hopkins University, was completed in November 1964.[6] Approximately 75 percent of the bulk of the Eisenhower Library was placed below ground. Only one and one-half of its six floors are visible from Charles Street. From there, an observer looks up past a pleasantly graded, landscaped slope to the library, its Georgian exterior complementing neighboring buildings. Below the modest upper structure are four and one-half larger floors, each measuring 292 by 110 feet, that benefit on the south side from sunlight admitted by a natural 30-foot depression. It is here that the reading rooms on the main floor are located, the southern wall of the reading area largely composed of windows and glass doors that lead to an open-air reading terrace. The building is fully air-conditioned. The lighting is largely, but not entirely, fluorescent.

Large sections of underground space are located beneath high-rise library buildings. In order to consolidate departmental science libraries under a single roof at Brown University in Providence, Rhode

Island, the architects, Warner, Burns, Toan and Lunde, in 1966, designed the sixteen-story Science Library as a visual reference point and symbol for the university's science complex. To preserve the impact of the tower rising straight from the ground, the architects put the largest and busiest space underground. The 25,000-square-foot lower level, which covers five times the area of one tower level, contains the main working library floor. It is dropped below a podium that is skylit at both ends. Sunken courts at the four corners of the tower offer additional daylight and a landscaped view for the underground interiors.

In 1973, the twenty-eight level, 110-by-110-foot library structure at the University of Massachusetts, Amherst, was placed on a two-level podium of 228 by 324 feet. Two staircases lead from the entrance level down to the main floor where the office, reading rooms, and public and technical services are located around a sunken court that lights these spaces. The two underground levels have been built into a sloping site. The lower level receives light from the side and offers a view of the beautiful campus lake.

Also placed into a slope is the Bristol, Pennsylvania, public library.[7] The Margaret R. Grundy Memorial Library, located along the lower Delaware River in the historic district of Bristol, opened in June 1966. By placing the bulk of the building into a bank, the architects, Carroll, Grisdale and Partners of Philadelphia, preserved the residential scale of the neighborhood and accommodated the structure to the change of levels from the street above to the riverside terrace. Visitors enter from the street level through an above-grade glass-enclosed pavilion, which encloses a stairway, an elevator, and a balcony. The lawn-covered roof offers open vistas of the river and the garden, including a public sidewalk of red brick. Descending the steps into the library, visitors look out on a garden through the exposed side of solid-glass windows and doors. The library, which is 250 feet long by 75 feet wide, covers approximately 15,000 square feet. It has a shelving capacity of 55,000 volumes and seating for fifty.

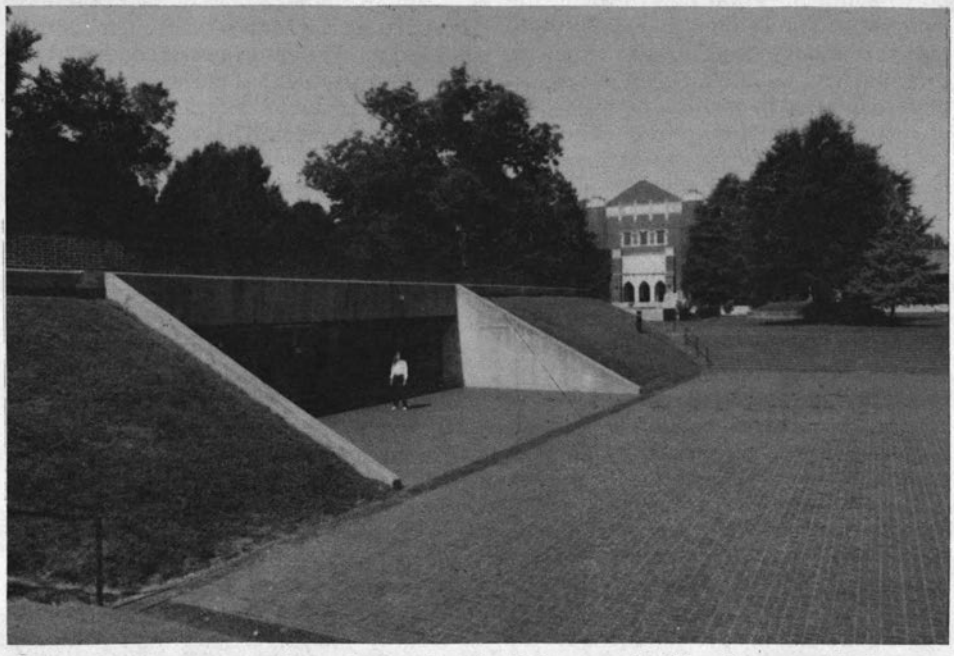
Because the the building is constructed of poured concrete with vinyl floors and glass walls covering two sides, there are problems with noise, temperature control, and humidity. Water leaks occurred in the roof of the above-ground entrance structure as well as in the concrete ceiling that is under the irrigated lawn. The entrance roof has been replaced and the librarians hope that the two large areas on either side of the entrance will be replaced in the next few years.

The first library to be built completely underground was constructed in 1967 in Conway, Arkansas.[8] Because the preservation of the integrity of the site was a concern, no one at Hendrix College wanted to place the new Bailey Library on the school's flat, open mall. The problem was resolved in 1967 by architect Philip Johnson of New York City, in collaboration with Joe Lambert, landscape architect of Dallas. Johnson and Lambert's solution was a two-story subgrade library under the mall, already the focus of campus activity.

Hendrix planners carved out a large sunken plaza to serve as the approach to the library's first-floor entrance. Earth removed from the plaza was used to bank the library structure and to create mounds, hillocks, and undulations on the formerly flat mall that now includes terraces and a fountain, cascading continuously into a pool. The top of the library is a conversation piece. It is a brick-paved patio with planters large enough to accommodate trees and shrubs.

A series of gardens were created at different levels and a visitor may descend to the upper floor of the library without the feeling of entering a basement. The feeling of spaciousness, created outside, is intensified upon entering the library. Because daylight is absent, and to offset the psychological effect of entering the earth, the library's lighting is considerably brighter than usual. This gives the Bailey Library an uncloistered feeling.

The Bailey Library, with approximately 32,000 feet of gross floor space, will accommodate 115,000 volumes and 420 seating spaces, including 240 individual carrels. Happily, the library does not need a



Hendrix College in Conway, Arkansas: Large sunken plaza is the approach to library's entrance. Earth removed from the plaza was used to bank library and landscape mall.

heating plant because the earth is a good insulator. Even in winter, light and body heat are the only heat sources the library requires. Also, air conditioning is less expensive to operate due to earth insulation—as much as 35 percent less than would be required for an aboveground structure. Unfortunately, with the first heavy rains of fall 1967, the Bailey Library leaked. For more than fifteen years, leakage has remained a problem. On the other hand, the library provided a link between Hendrix College and the residents of the county when many citizens sought refuge in the underground structure during storms and tornado warnings!

Stately architecture and aging books prompted the University of California at Los Angeles to extend the underground portion of its Clark Memorial Library.[9] The library, located ten miles from campus in Los Angeles's Crenshaw District, is a research facility constructed, in 1926, in Italian Renaissance style. It is stocked with 70,000 rare books and 5,000 manuscripts. In 1951, the library added a block of underground stacks by extending its basement. In 1968, the architectural firm of Cordes and Crosby, Los Angeles, pushed this extension still further, under the library's front lawn. The underground structure is ideal for preserving the library's old books and papers because the temperature and humidity are easily controlled. Just thirty inches of earth lie atop the library. To waterproof the structure, layers of coal-tar saturated felt and cotton fabric were wrapped around it, with alternate moppings of coal-tar waterproofing pitch. Underfloor drainage channels were installed to remove ground water. Made of reinforced concrete, the building provides approximately 4,500 square feet of floor space. Besides 2,070 square feet of stack area, the addition provides researchers with ten studies, a lounge, a kitchenette, and restrooms.

In June 1969, the new University of Illinois Undergraduate Library at Urbana-Champaign was dedicated.[10] The University lies between Urbana and Champaign with its major axis of development in a

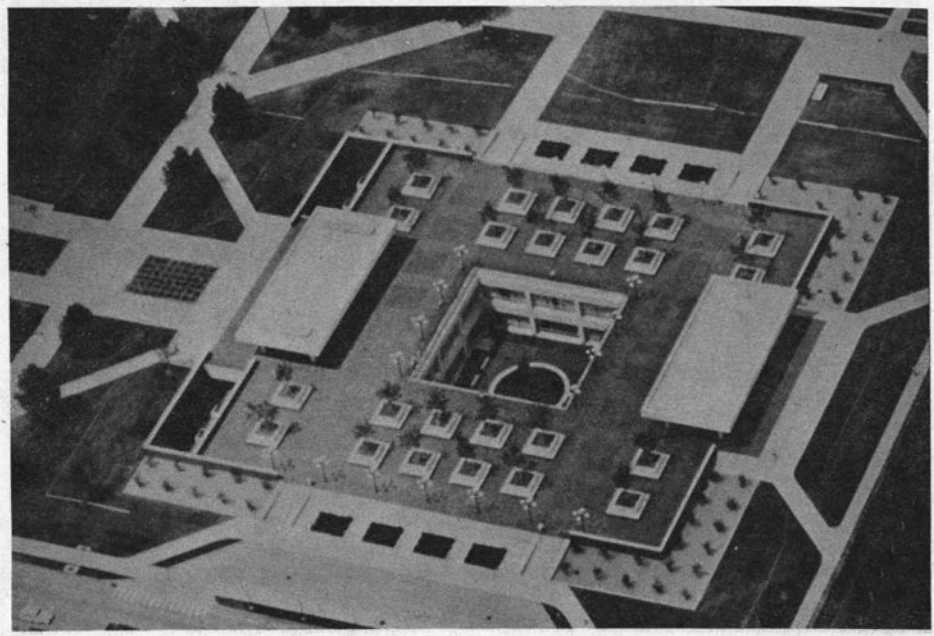
north-south direction described by the main mall. The campus is mostly organized around the liberal arts and sciences core, the nucleus of which is the General Library, housed in a building constructed in 1930. Because the number of undergraduates had grown to 24,000, it became necessary to enlarge the library. The site chosen was directly east of the existing structure, which was central in relation to undergraduate classrooms and residence halls.

The architects, Richardson and Associates of Champaign, and Urbana's planners had two reasons for putting the new library underground. First, they wished to maintain the open appearance of the mall. Second, they had vetoed a normal aboveground structure because it would have shaded the nearby Morrow Plots, the oldest agricultural experiment fields in the United States.

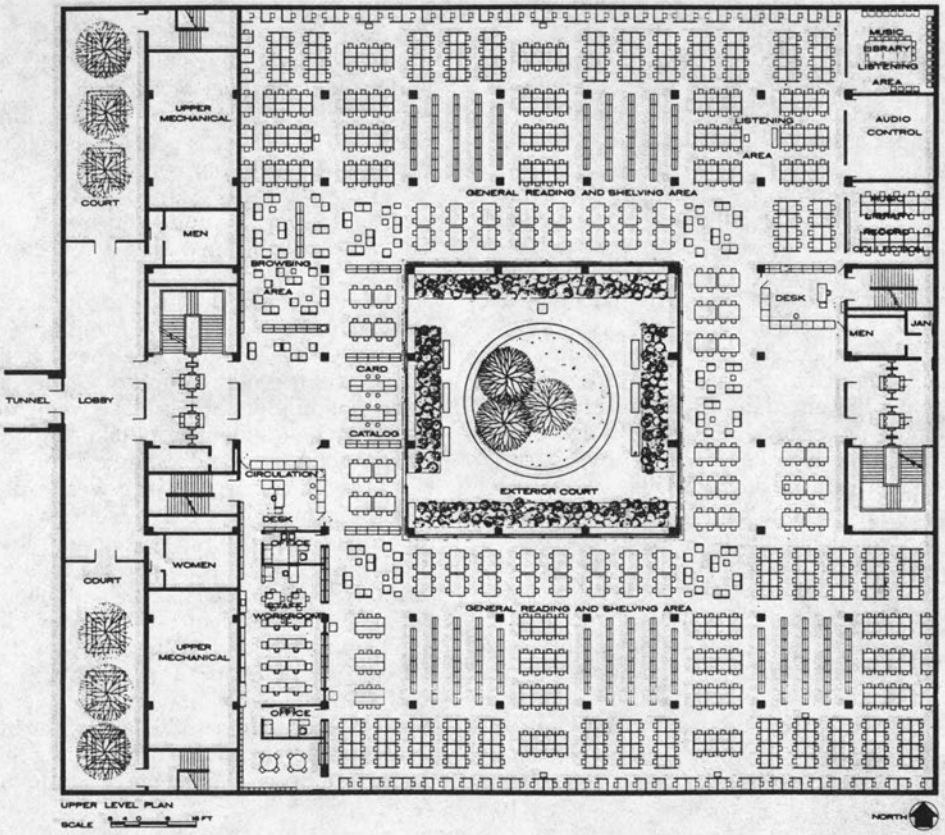
The new library is of modular design with maximum flexibility of space. It consists of two floors approximately 217 by 241 feet with a 72-foot square sunken court. A tunnel connects the upper level with the basement of the General Library building. The grade level is conceived as a landscaped, lighted plaza. Bench seating is integrated into large, tree-size planting tubs on the plaza. The red-brick pavilions, located on the east and west sides, give access to stairways, elevators, and dumbwaiters. These pavilions are designed to give definition to the building entrances as well as to provide an edge to the plaza and to heighten its aesthetic effect.

All feeling of being underground disappears as soon as one descends to the first level. Each level is square with a courtyard in the middle opening up to the stone plaza and sky above. The courtyard is accessible from the lower level to provide controlled outdoor reading space in fair weather. The walls enclosing the court on each level are made of glass so that the view into the light and grassy landscape of the court gives the impression of being above ground.

Approximately two-thirds of the library's 1,905 seats are individual study



University of Illinois–Urbana-Champaign: View of the broad plaza, which forms the top of the Undergraduate Library, with two entrance pavillions and the sunken court.



University of Illinois Undergraduate Library: Floor plan of the upper level with tunnel at left leading from the main library building.

carrels that provide as much privacy as can be arranged in the unpartitioned areas. There is book space for 150,000 volumes. If there is a need for more shelving space, the structural system is designed to permit expansion to the north and south. Ultimately, the facility can be doubled in size.

The entire building is air-conditioned. A general lighting intensity of ninety footcandles is specified in both reading and shelving areas. Wall-to-wall carpeting and acoustical ceilings are provided throughout in order to assure maximum quiet.

It is said that this library is designed more for people than for books and, indeed, the Illinois Undergraduate Library has won several architectural awards. Nevertheless, some severe water conditions had to be dealt with. Because the building is below the water table, it was to be constructed as a concrete boat. Rain and melting snow are taken off by a sump pump system. In the event of failure, an auxiliary generator assures power.

In January 1971, the underground addition to the Sterling Memorial Library at Yale University in New Haven was opened.[11] The two-level facility, designed by Edward Larrebee Barnes of New Haven, has been built directly across from Sterling's main entrance beneath the Cross Campus Green, a popular place for student relaxation. To save this precious large green area, the Cross Campus Library was built underground, connected

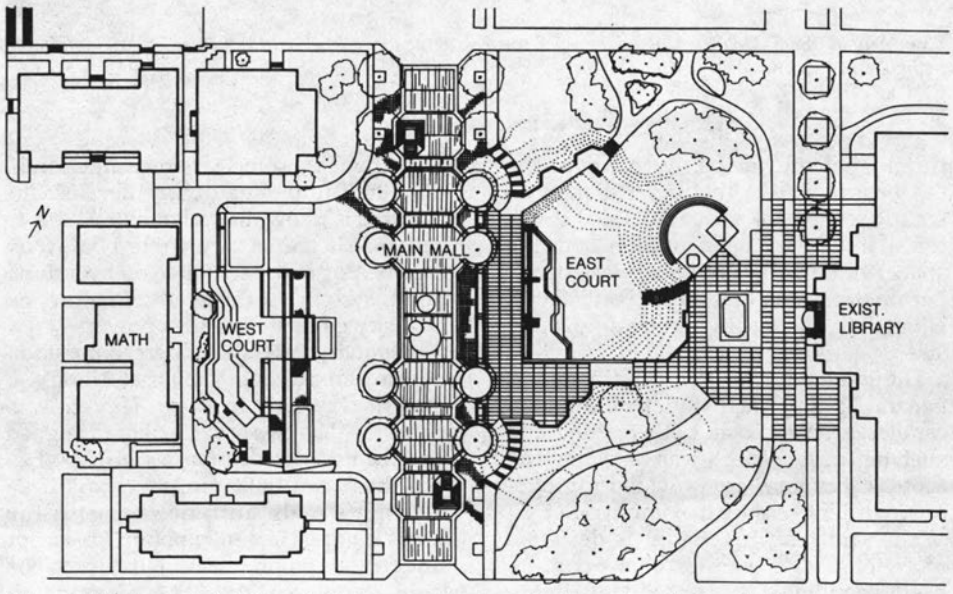
to Sterling by a tunnel beneath High Street.

With a capacity of 225,000 volumes, the Cross Campus Library is operated as a part of Sterling for intensive use of books under heavy demand by undergraduates, graduate students, and faculty. The Cross Campus building was designed to provide greatest flexibility, allowing juxtaposition of readers and books. Seats are available for 750 readers. The air-conditioned facility is rectangular, measuring 223 by 140 feet.

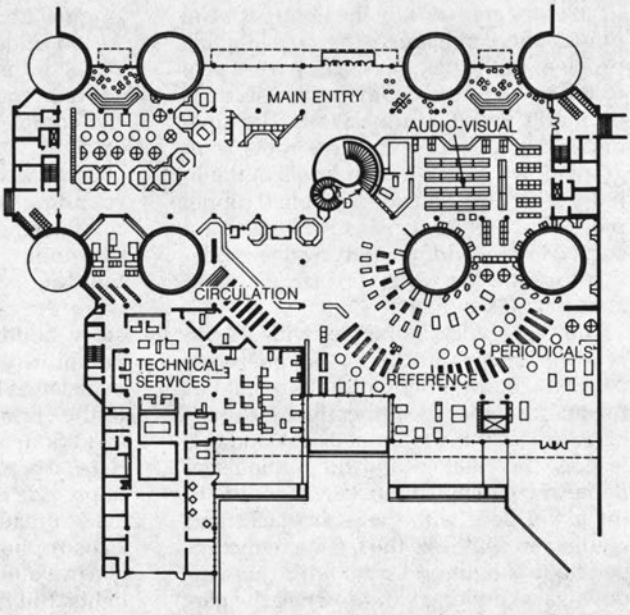
The route from Sterling passes through a student lounge and leads directly toward the circulation desk on the addition's upper level. On either side of the tunnel entrance, two 30-by-32-foot sunken courts allow an alternate access route from High Street when Sterling is closed, and simultaneously provide some measure of daylight in the subterranean building. Unfortunately, these courts suffer from frequent water leaks around the perimeters. Two enlarged emergency exits at the other end let in additional light. The color of all painted surfaces, furniture, and equipment has been coordinated with the lighting to assure uniform illumination without glare or distracting contrasts.

A classic space problem arose in Canada in 1972 when the University of British Columbia at Vancouver faced the need for more library space. The new structure needed to be located as near as possible to the Main Library, but could not destroy the university's oak-lined pedestrian mall.[12] Architects Rhone and Iredale of Vancouver determined that a two-story building for the Sedgewick Undergraduate Library could exist under the main mall, as this ran past the existing library about twelve feet higher than the main library entrance. On the opposite side, an eight-foot differential existed between the mall and the Mathematics Building. This was the chance for landscape gardening of two terraced courts. East and west exposures open onto these courts, with precast planters overhanging glazed window walls. Pedestrians could use the mall as usual, with no grade changes and, about twelve feet below, both old and new libraries could share the same entry level.

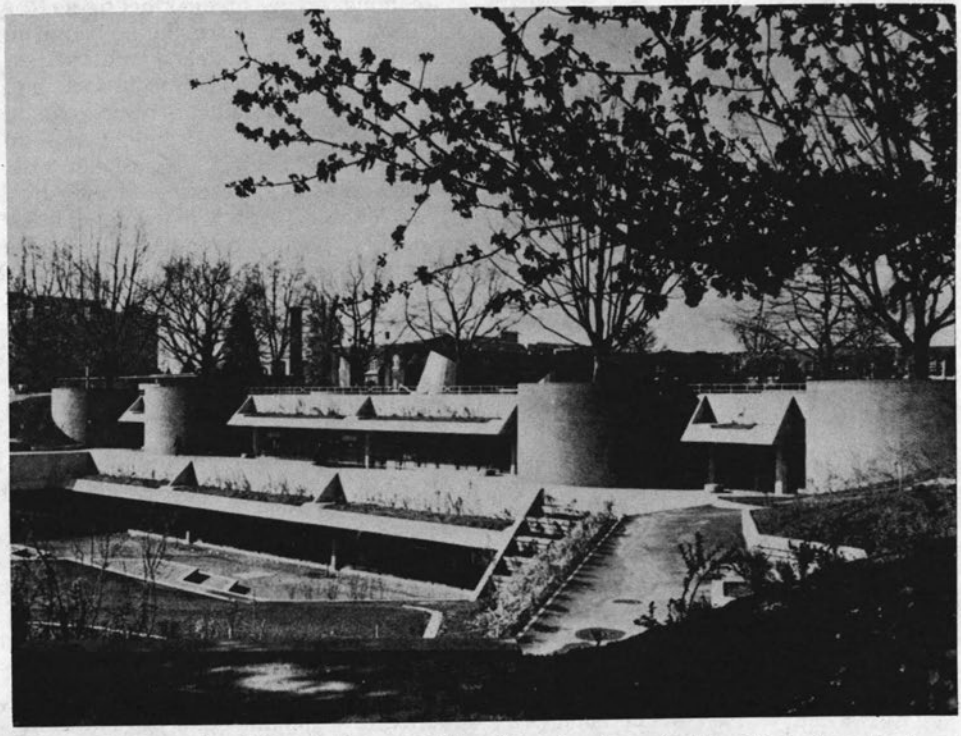
Two truncated cones that rise from the mall form skylights that provide views into the library and natural light for the internal spiral staircase. Before reaching the cones, a stairway at either end leads down



Sedgewick Undergraduate Library in Vancouver: Site plan with the main mall above the library.



Sedgewick Undergraduate Library in Vancouver: Floor plan of the upper level with the main entry and the eight drums for the oak trees flanking the mall.



Sedgewick Undergraduate Library in Vancouver: View of the main entrance facade and the landscaped east court with the oak trees in the drums flanking the mall.

to an entry area outside the library control point. There remained the considerable problem of the oak trees. They were protected by high steel drums built of sections ordinarily used for tunnel work. The nine-meter drums encase the tree roots from grade down through both levels of the library structure. Outside the bolted tunnel plate is an air space, insulation, and a curved brick cladding, a strong design element interrupting the very large area of about 113,000 square feet.

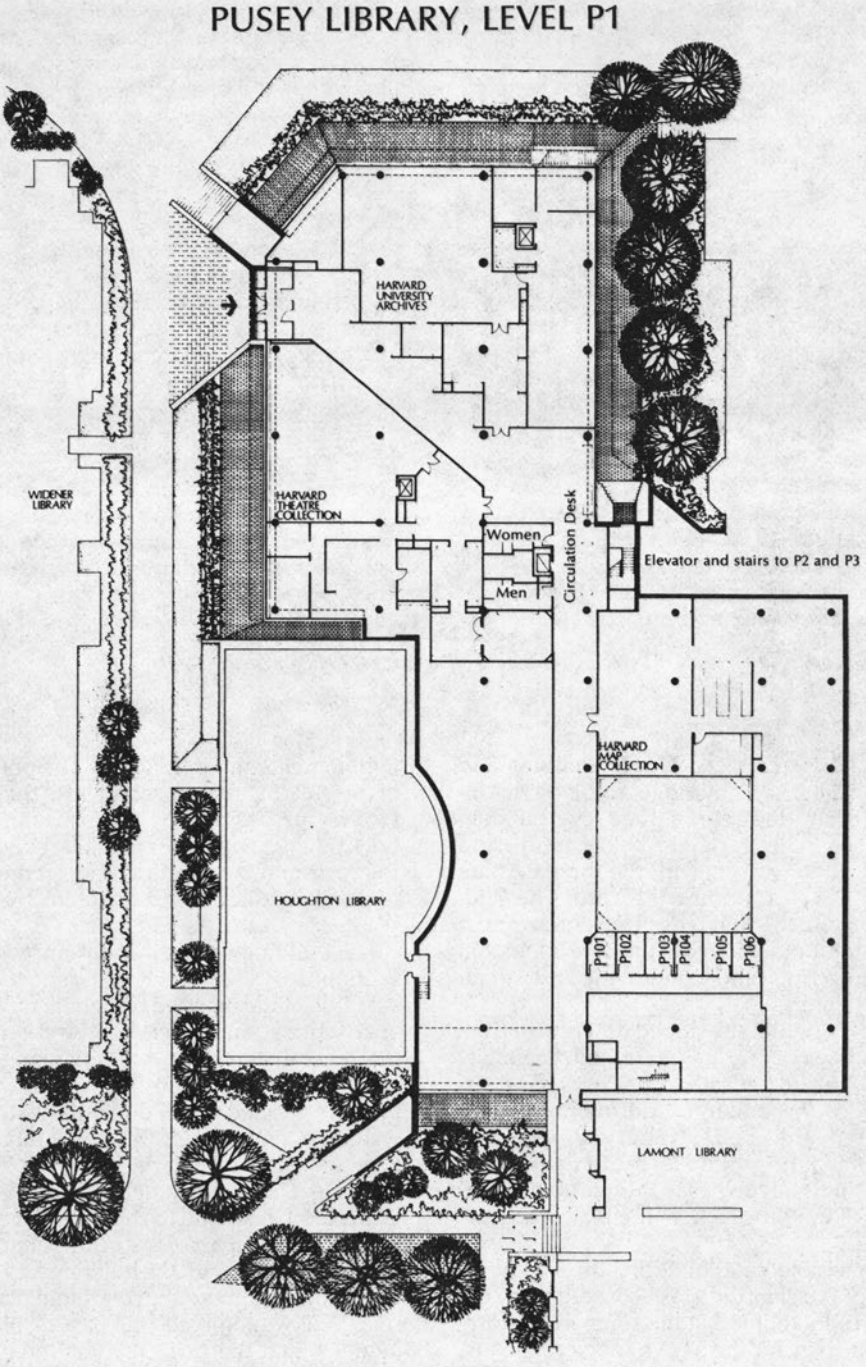
The Sedgewick Library provides 1,646 reading spaces and has a capacity of 200,000 volumes. Behind the turnstiles at the main entry of the upper floor is the circulation desk, the reference desk and collection, the catalog, and the audiovisual department. The spiral staircase leads to the lower floor with the main stacks and reading areas. While the feeling of the upper floor is light and airy, with the window walls' inviting view down to the garden, the heavily furnished lower level finds its greatest use in a range of visual activities.

Sedgewick Library is an excellent example of how solutions to underground building problems can be found. It won the 1972 Award of the Canadian Architecture Yearbook, and the 1973 First Award of the Royal Architectural Institute of Canada, the highest architectural award in Canada, in a competition that includes all types of buildings.

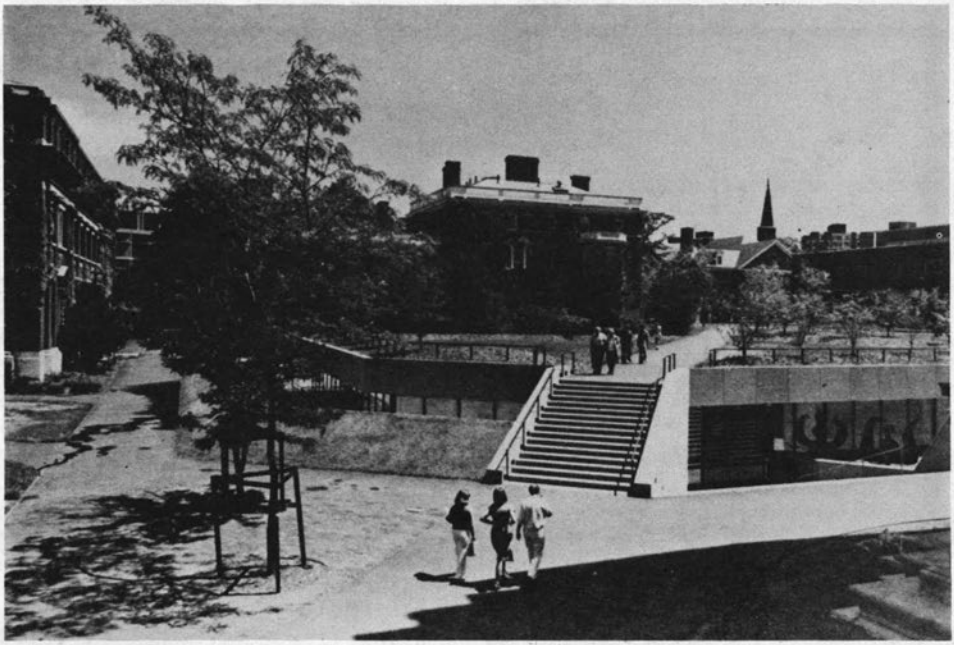
In 1975, one of the largest scientific libraries in the United Kingdom, the Radcliffe Science Library, Oxford, England, constructed an underground extension that is believed to be the largest below-ground library space of any British library.[13] The original library in the Radcliffe Campus opened in 1749. In 1861, the collection was brought to the University Museum. Because of the rapid expansion of natural science literature, it was necessary to construct, in 1901 and 1934, the two wings of the present library. The holdings grew more rapidly when the library was incorporated into the Bodleian Library in 1927. The library's shelving was filled by the early 1960s. In 1968, the decision was made that the area to the west of the University Museum, partly embraced by the original library wings should be allocated for an underground extension. After the plans of the university surveyor were accepted, construction began in 1971 and the completed extension was opened in 1975.

Because of the close proximity to surrounding buildings, the substructure of reinforced piled concrete foundations, underpinning the existing buildings, and building with waterproof construction were the costliest elements of the two-story building. The second biggest expenditure was the heating and ventilating installation because there are no openings to the surface. The entire building is air-conditioned with humidity controlled at 50 to 60 percent. It was of vital importance to provide an environment that is acceptable to readers and staff and that avoids claustrophobia. The last is a serious problem in a building without windows or skylights. But the lighting, color scheme, and positioning of the furnishings have been accomplished in a manner that creates the illusion of greater space. Sound is well insulated from the exterior and the low background noise level was distracting to the staff. Consideration is being given to the introduction of background noise to raise the sound level. Nevertheless, the subdued atmosphere is welcomed by most of the 260 readers in the upper level, which has a capacity of 190,000 volumes for the physical sciences. The lower level contains mobile high density storage units for 570,000 volumes. The gross floor area of both levels is about 46,000 square feet.

In 1976, the Harvard University Library at Cambridge, the largest university library in the world, opened the Nathan Marsh Pusey Library, an underground addition to its Harvard College Library.[14] Of the eight libraries constituting the College Library, three required their own reading rooms and better conservation of their priceless collections. These were the Harvard Theatre Collection, the Harvard University Archives and the Harvard Map Collection. The main problem faced by the designers was how to tuck a building unobtrusively into one of the few remaining open spaces on the crowded, busy site of Harvard Yard, a site of great historic inter-



Pusey Library at Harvard: Floor plan of the upper level, showing how the library is placed between Widener, Houghton, and Lamont Libraries.



Pusey Library at Harvard: By placing the library below grade the buildings surrounding Harvard Yard remain unobstructed. (Photo: E. J. Jacoby).

est. The architects, Hugh Stubbins and Associates of Cambridge, resolved this dilemma by designing a three-level building whose main parts are below grade and that interconnects with the three existing libraries surrounding the Yard: The Widener with its research materials; Houghton, which contains rare books and manuscripts; and Lamont, the undergraduate library.

The original site sloped downward from south to north and was crossed diagonally by a major pedestrian pathway. The design of the underground building maintained the pedestrian walkway but changed the ground level to a flat surface. This partially exposes the northwest corner of building, where the main entry occurs.

In visible exterior form, the Pusey Library is a slanting grass-covered embankment. Its roof is a stone-rimmed platform of earth including a lawn, flowering trees, and shrubs. On axis with the Neo-Georgian bowfront of the Houghton is a square sunken courtyard, which admits light to major interior spaces. The portion of the building that appears above the surface is surrounded by a broad band of brick paving, which forms a moat between the berm and the window wall. At the top of the berm is a deep concrete trough planted with shrubs and vines.

The building's principal entrance is set at its northwest corner, adjacent to the east side of the massive brick bulk of Widener Library, and is reached by descending several steps. The walls flanking the steps repeat the reddish gray Canadian granite, selected for all the visible exterior walls and stairways of the Pusey Library. Past Alexander Calder's black steel stabile, *The Onion*, heavy glass doors open into a brief vestibule to this main level. A major corridor, part of the principal public passageway through the building and corresponding with the above-ground pedestrian walkway, directs one past displays, lounges, and the main reading rooms of the three special collections.

All the reading rooms and offices on this level have large windows facing the moat

around the building or the central sunken courtyard. The larger stacks for the University Archives and manuscript stacks from the general collection occupy most of the second level. Located on this level are entrances to the three adjacent library buildings. Faculty studies are found on three sides of the central courtyard. The lowest level, about half the area of the upper two levels, contains more stacks of the general collection. The building is 87,000 square feet.

The decision to place the Pusey Library underground presented a number of obstacles. The water table is very near the surface and melting snow or heavy rains can cause flooding. To prevent this, a grid of perforated drainpipes was laid beneath the foundation slab, behind the buried walls and on the earth-covered roof. Any water seeping into this zone near the building is drained by four sump pumps. All building surfaces are waterproofed with a mastic coating, neoprene, or both. The entire building is protected from fire by a system using tanks of liquid halon stored under pressure and released as a gas in the precise amount needed to extinguish the fire.

The need to protect the contents of the structure resulted in a variety of unusual measures being taken. For example, all fluorescent lighting fixtures are covered with ultraviolet shields to protect the materials from deterioration. Windows are triple glazed to aid in the careful control of humidity. The subsurface design also contributes to the security of the building, with limited, well-controlled points of access. Sound reduction is another benefit of underground space.

Built at a time when energy conservation was not a major concern, the level of energy consumption, because of the unusual climate control requirements, appears high. In large portions of the building, interior temperature is maintained at seventy degrees Farenheit and relative humidity at 50 percent year-round. But because of the large mass and reduced infiltration of the underground structure, the system can be shut off without affecting humidity or temperature for as much as eight hours or longer and, consequently, operates only about fifteen hours per day. As a result, the energy consumption is less than predicted in the planning stage: electrical use was expected to be twice and steam use five times as much.

Pusey Library and its designer have received an award for architectural excellence from the American Institute of Architects and the American Library Association for the successful union of function and form.

In 1976, another library with a capacity of 100,000 volumes was built below grade at the University of California at San Diego in La Jolla.[15] The library of Scripps Institute of Oceanography was set into a hillside, cropping out to the leeward.

For a long time, the Avery Memorial Architectural Library, one of the great libraries of architecture, suffered from lack of space. Established as a branch of Columbia College Library in New York in 1890, it acquired in 1912 a proud building of its own. Avery Hall, a four-story Neo-Renaissance palazzo, was designed by Charles McKim, of the great firm of McKim, Mead, and White, who had also provided the master plan for the new campus of Columbia University. Because of the lack of campus space and the need to preserve Avery Hall, Alexander Kouzmanoff, chairman of design at Columbia's School of Architecture, in 1977 followed the examples of Harvard and Yale and solved the complex task of extension by going underground beneath the central portion of Fayeweather Court.[16]

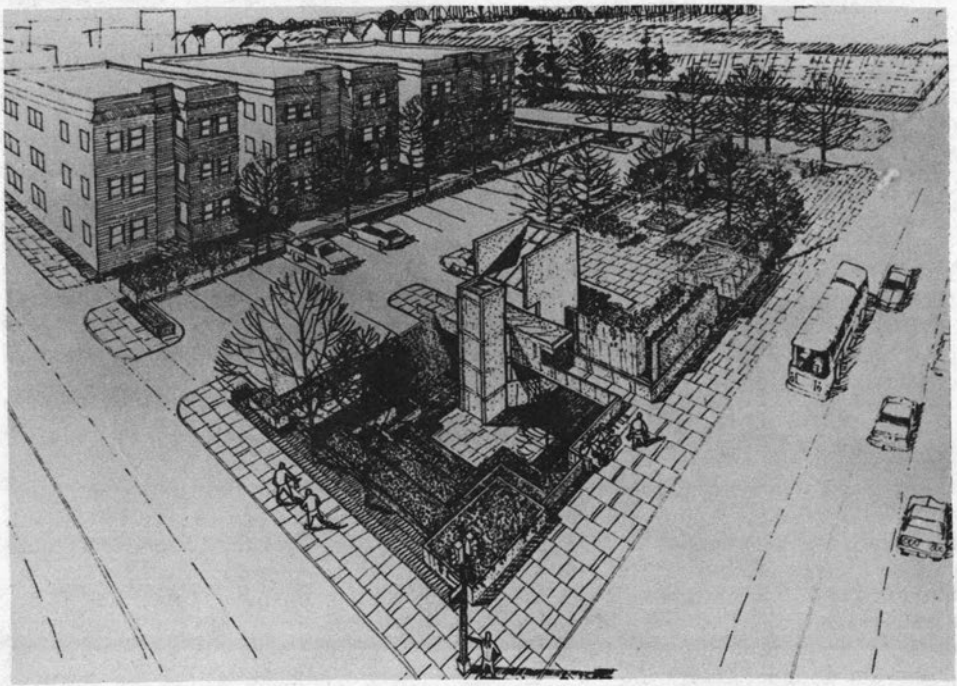
On a lower level, the 80-by-150-foot construction provides a large and small auditorium, classrooms, and wide exhibition spaces for the School of Architecture and, on the upper level, a new reading room and reference-service area for the library of Architecture and Fine Arts. These levels are connected to the old Avery building by separate staircases: directly to the old McKim Reading Room on one level, and to the elevator lobby of the School of Architecture on the other. Under a skylight, the grand stair between the old and the new reading rooms achieves a particularly dramatic opening of a classical space into a modern one. The basement level of the old Avery building is now fully open toward

the new rooms. Together with the new building, the completely remodeled old one forms a preeminent research institution for the whole subject field.

The year 1980 appears to be the first year a public library was constructed below grade. Located at a busy intersection in a south Minneapolis commercial center, the Walker Community Library is a satellite facility serving the immediate neighborhood.[17] The 18,500-square-foot structure contains a large reading room with a medium-sized book collection and a public meeting room that serves a variety of community groups. The almost completely subsurface design resulted from a combination of site-related factors and the desire to take advantage of the sound reduction and energy-conserving benefits of underground space. An important factor in the decision to place the library below grade—besides the limited size of the 20,000-square-foot site—was the desire to create a community resource on the site. A small, urban plaza on the roof of the structure was created to provide space for neighborhood activities. Additional roof space provides necessary parking.

To define the edges of the building and to direct people to the entrance, planters, walls, and other above-grade elements were necessary. The street-level entrance, mechanical equipment, and an elevator shaft are designed as a small grouping of above-grade concrete forms. Because the main occupied spaces in this building are completely underground, the small sunken courtyard becomes important for natural light and view. A single large window in the lower-level reading room faces the courtyard. A large adjacent mirror is set at forty-five degrees from the wall to reflect light into the room and to create the illusion of looking out from nearly any point in the room.

The interior space of the reading room is, at about twenty feet, relatively high. An open grid suspended from the ceiling contains light fixtures and heating equipment. The designers estimate that the de-

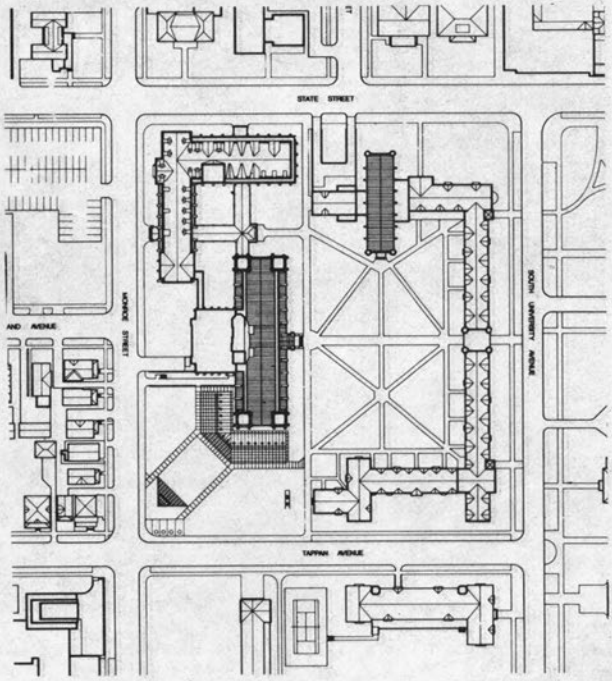


Walker Community Library in Minneapolis: View of the entrance, the plaza at right, the sunken court at left. (Photo: P. Siegrist).

mand for heating and cooling will be reduced by 40 percent compared with a conventional above-grade building. A heat recovery system reduces the energy used to heat and cool outside air for ventilation, and insulating shutters are rolled down over the windows at night. In addition, the hard surfaces on the roof are shaded by plant materials and vines hanging from trellis structures supported by light fixtures for the parking area. The level below grade contains the 150-seat community meeting room. Together with the library and the plaza, this is a very attractive location for neighborhood activities.

Undoubtedly one of the most striking libraries built underground is the Law Library Addition at the University of Michigan, Ann Arbor, opened in 1981.[18] It is a remarkable example of the potential for providing natural light, a view, and dramatic interior spaces underground. The structure was designed by the architectural firm of Gunnar Birkerts and Associates of Birmingham, Michigan. The master plan for the law school, which occupies an entire city block, had been completed in its final form except for the southeastern corner. The buildings were designed in Neo-Gothic style, and constructed between 1924 and 1933. The corner was designated as the site for the proposed Law Library Addition. However, the architect felt that a structure placed in the open area next to the older library building would shift the balance of the entire complex. A completely underground design was the only solution to achieve both compatibility with historic buildings and preservation of open space and views on the L-shaped site.

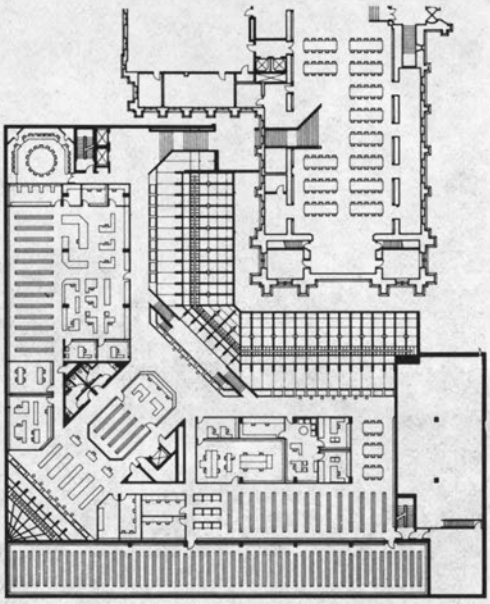
Three L-shaped levels with a total of 77,000 square feet were placed completely beneath the surface. The architect flooded the three underground levels with daylight by placing a 150-by-26-foot sloping skylight within a V-shaped moat and a smaller triangular well. A sloping limestone wall and a series of mirror mullions permit light to enter levels that are set back from the light well and form balconies overlooking multistory spaces. Natural light is available in most areas of the building. At night, the skylights permit views of the lighted interior. Entrance to the un-



Law Library Addition, University of Michigan, Ann Arbor: Site plan of the Law Quadrangle.

derground facility is through a pleasing direct stairway from the old library to the upper underground level. On this level are the catalogs, a circulation desk, and reading rooms; the other two rooms contain mainly book stacks. An open grand

Law Library Addition, University of Michigan, Ann Arbor: A series of mirror mullions at left permit light to enter all levels which form balconies overlooking the light well.



Law Library Addition, University of Michigan, Ann Arbor: Floor plan of the upper underground level with a direct stairway from the old library.

stairway in the center of the light-well area is designed as an elaborate suspended form. The building is designed to accommodate 500 readers and to house about 500,000 volumes.

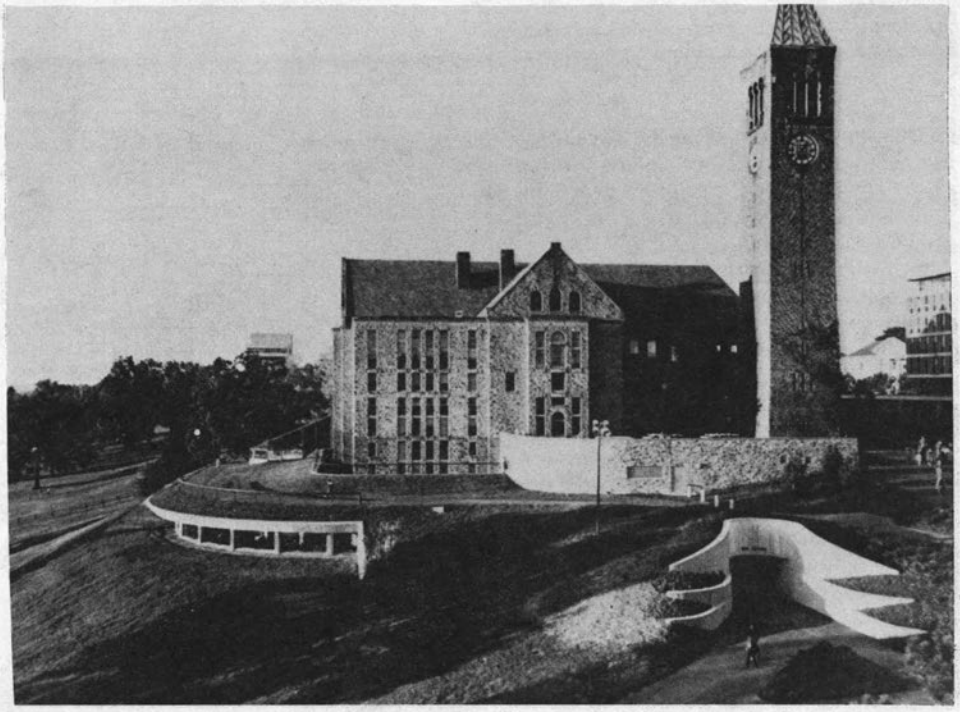
Because of its below-grade placement and relatively small total glass area, the building envelope is inherently energy conserving. Efficient, air-return parabolic luminaries are used for general lighting, and fixtures near the light wells have photocell controls that automatically turn lights off when an adequate level of natural light is available. Nevertheless, the energy consumption is high because of the extended sixteen hours of operation per day. The sloping light well is supported by vertical concrete piles forming a retaining wall to protect the existing foundation of the adjacent older building.

With the experience of Ann Arbor behind him, architect Gunnar Birkerts designed one more underground library. In September 1982, the Uris Undergraduate Library of Cornell University, Ithaca, New York, opened an underground extension of the old building.[19] For reasons of security and to avoid wear and tear that would result from through traffic, the addition is accessible only through the old structure. No separate entrance exists.

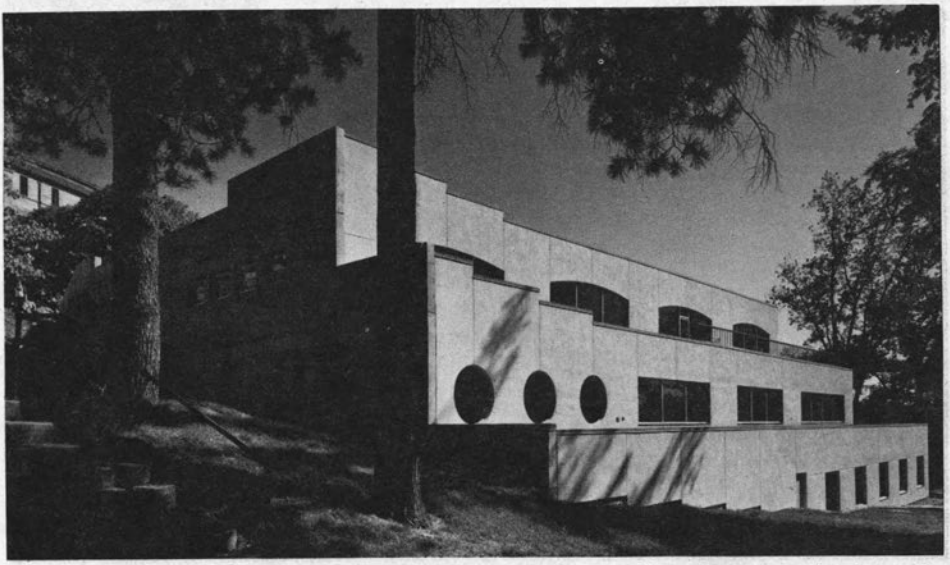
The stairway connecting the two buildings is enclosed in glass and provides a panoramic view of the valley below and the landscaped surroundings, thus transforming a potentially negative descent into an unusual spatial experience. Much emphasis is placed on the design of the connection between the above- and below-grade buildings. The addition is essentially a reading room with no shelving space for books. There is no staff working space, except for a monitoring station at one end of the room. The underground addition has a total of 214 seats, including 15 in three group-study rooms of 5 seats each. The addition satisfies the long-standing need for more study space in Uris Library and, therefore, has been very popular with students who use it heavily. It has become the most popular reading room in the library.

Early in 1983, the archabbey of Saint Meinrad, Indiana, opened a much-needed new academic library building.[20] The library is a part of the new building program for the monastery. Designed by the architectural firm of Woollen, Molzan and Partners, Indianapolis, the plan aimed at replacing and upgrading older facilities. Some of the buildings date from the 1850s when a mission of Benedictines from the home abbey in Einsiedeln, Switzerland, following a wave of Swiss and Bavarian immigrants, crowned a hilltop in southwestern Indiana with a Neo-Gothic church and monastery.

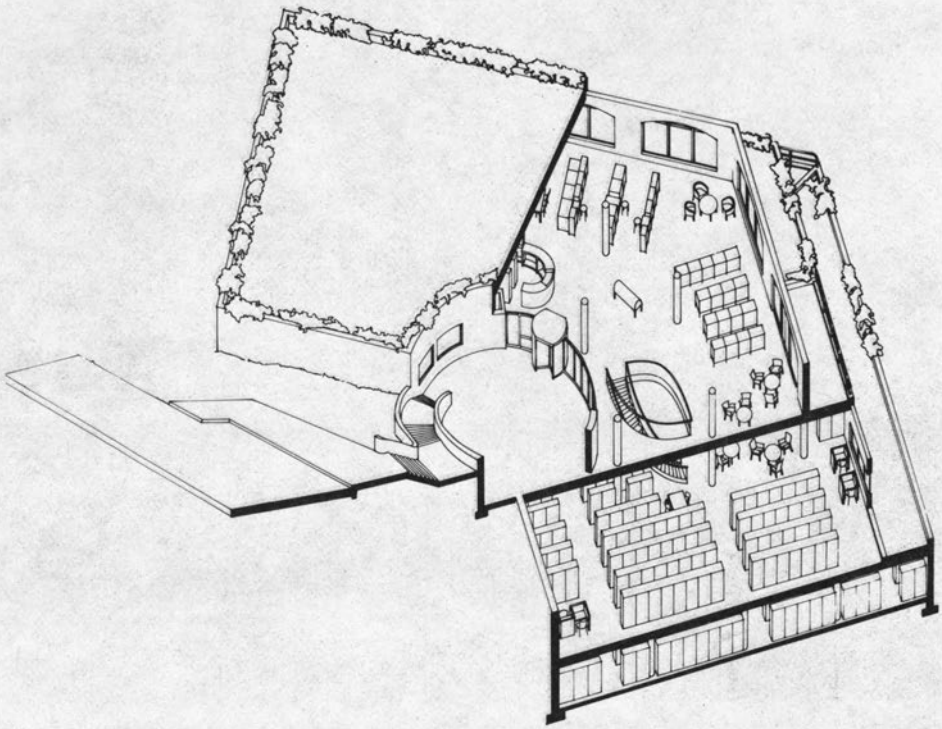
The new library is to serve the college, the theology school, and the monastery as a research and study facility. Because of the topography of the site, and in order to leave the remaining nineteenth-century buildings undisturbed, the library is angled into a hollow at the foot of the hill below the main entry to the school. The land surrounding the trilevel building, whose entry is at the top floor, is a terraced slope planted as a garden. The terrace theme is carried forward by a grass-covered, bermed roof and garden beds alternating



Uris Undergraduate Library at Cornell University: The addition to the old library is placed in a sloping site and provides panoramic view of the valley and surrounding. (Photo: T. Hursley).



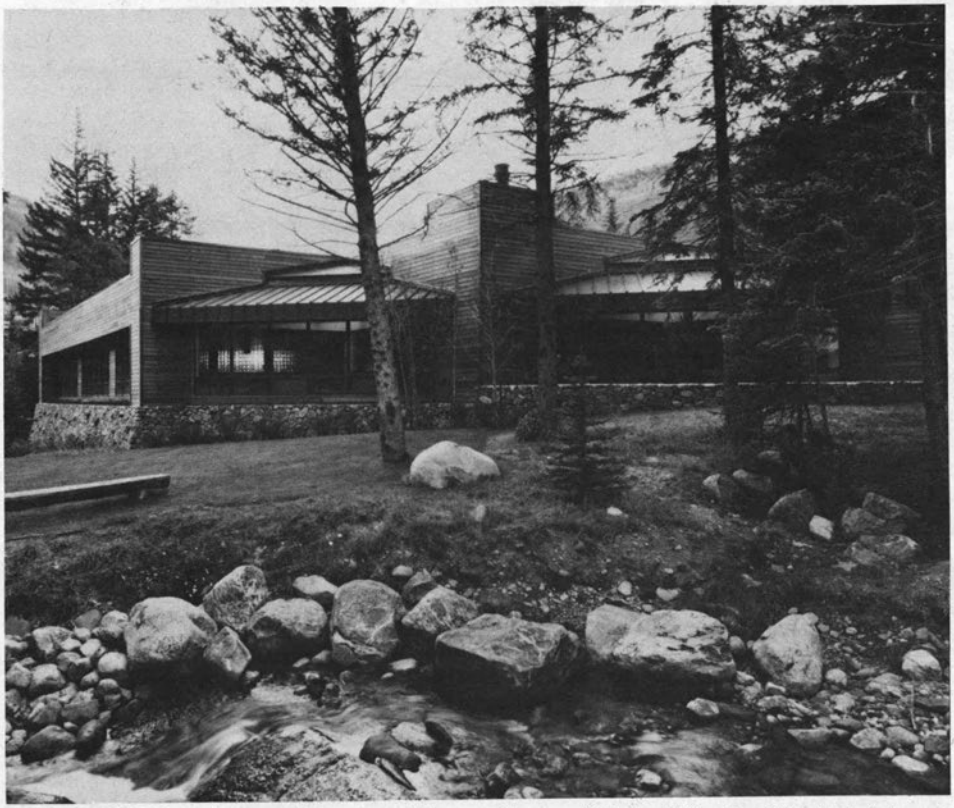
Saint Meinrad Archabbey Library: The library is conceived as a retiring building of terraces stepping down a steep slope. (Photo: B. Korab, Troy, Michigan).



Saint Meinrad Archabbey Library: Isometric view of the library through to the lower level.

with tile-paved seating on the decks of the lower levels. When the planting matures, the building will be draped in ivy. From the major pedestrian path of the archabbey, a double-ramped, descending staircase leads to the main entrance through a circular courtyard. Located on the entry level are the circulation functions and all staff offices. These are connected by a curving staircase, which leads to the more concentrated collections with carrels near the windows and small-group study spaces on the floor below. The lowest level is devoted to archival materials and technical service areas. The 39,000 square feet of assignable space provides room for 200,000 volumes, and 152 reading places.

The new public library in Vail, Colorado, was dedicated in July 1983. Designed by the architects Snowdon and Hopkins of Vail, the building is recessed into a slope that permits a southeast exposure looking out on the confluence of Middle and Gore creeks. The 16,375-square-foot structure has a post-tensioned concrete roof that has been covered with soil. This earth-sheltered design was created for heat efficiency in a snowy climate and to achieve minimal visual impact. Native stone and redwood were used on the exposed parts of the building. The entire length of the north/south entry corridor is a skylight that provides a dramatic and spacious entrance for the library and the community rooms that are available for use when the library is closed. The building will accommodate 60,000 volumes and seat ninety in the library, sixty in the community rooms, and fifteen in a multipurpose room. This latter room is enclosed in glass block and fitted with heavy drapes to darken it for screening movies or watching videocassettes. The staff and users are very pleased with the library, which received the 1985 Award of Excellence for Library Architecture in the eleventh Library Buildings Award Program sponsored jointly by the American Institute of Archi-



The Vail Public Library is recessed into a slope with a grass-lawn roof. (Photo: T. Hursley, Little Rock, Arkansas).

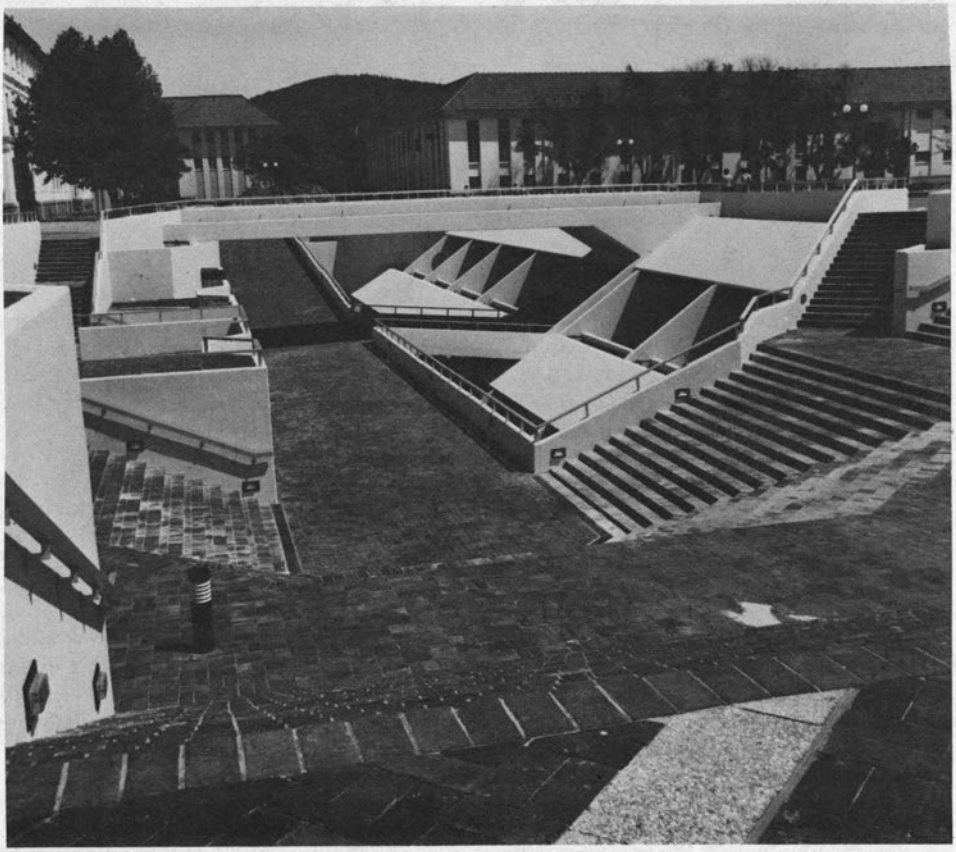
tects and the American Library Association.

South Africa's first underground library was opened in January 1984, in Stellenbosch, the country's oldest town, founded in 1679 in the mountainous western Cape.[21] The University of Stellenbosch Library, founded in 1866, replaced the old Carnegie Library building and centralized most library activities that had been spread across the campus. Architects' research had shown that a building on that site would not be compatible with the scale of the university square and the surrounding low-rise buildings. The decision was made to go beneath the historic Jan H. Marais Square, located close to most of the University's academic and administrative buildings. The new J. S. Gericke Library houses approximately 500,000 volumes with enough space for an additional 500,000. There are 1,663 seats for the roughly 12,000 users who are served by 110 staff members. With 180,000 square feet on two levels, the Gericke Library appears to be the largest underground library in the world.

The approximately 100,000-square-foot roof has been planned to retain the pedestrian "desire lines" and to give life to an otherwise barren landscape. The south of the roof opens into a trough, terraced by wide stairways descending to the main entrance on the upper level. Natural light is admitted from this side into the reading areas. The interior design facilitates orientation through a system of major and minor routes. Much emphasis is placed on spaciousness and flexibility, with skylights illuminating the main circulation ramp. Designed on a totally modular (25 by 25 foot) plan, the building is fully air-

conditioned and humidity controlled. Special attention has been paid to the acoustic treatment of the study areas. The building is waterproofed with a prefabricated membrane. Encapsulated in bituthane, the building has a water-resistant barrier of polyethylene and rubberized asphalt. No serious leakage in the construction has been experienced. The library provides a comfortable environment and user opinion is very favorable.

Opened in early 1985, the storage library of the Swiss Federal Institute of Technology in Zurich is the newest and one of the largest underground libraries.[22] The facility is located in downtown Zurich because the Polytechnic had no space left for expansion of its famous University Library designed by Gottfried Semper. In recent years, some library departments had been dislocated at the new campus on the Honggerberg, a hillside on the outskirts of the city. There, a sloping site was made available for the approximately 65,000-square-foot structure placed underground to preserve the landscape and to protect books and other property of cultural value from war damage or natural catastrophe. There are 49,000 square feet of assignable space, of which 4,000 square feet are devoted to patent specifications, 38,500 for little-used books, 4,800 for other items of cultural value and 1,600 for staff work rooms and a small reading room looking out on the hillside. Mobile stacks of compact shelving house 3,000,000 volumes.



Gericke Library, University of Stellenbosch, South Africa: Natural light is admitted from the south into the reading areas by opening up the square at the entrance to the library.

Gericke Library, University of Stellenbosch, South Africa: Visual emphasis is placed on the main circulation ramp in the atrium connecting both underground levels. (Photo: J. Stande, Stellenbosch).

The site provides the possibility for an underground addition of the same size. The two-story structural system is designed to support three above-ground stories as a further extension. For delivery of books and goods, the above-grade entrance is provided with a loading ramp and a lift.

CONCLUSIONS

These examples demonstrate the emergence in the past two decades of a new architectural trend. Underground architecture is a marriage of building and the natural environment quite unlike any other design movement of the twentieth century. Although subsurface construction is not new to history, it is new to architecture and landscape architecture and very new to library practice. Currently, there are twenty-two underground libraries, most of them in the United States, and some have received architectural awards.

The first underground library buildings have not experienced greater problems than above-ground structures. In fact, surprisingly few problems have been encountered. No more water comes into them than come through skylights or flat roofs on above-grade structures. Constructions beneath the water table are designed as concrete boats and careful insulation and drainage prevent any water seepage. Sunken courts sometimes omit that careful waterproofing. Air conditioning and humidity control can be maintained better underground than above ground because the extremes of day–night or seasonal temperature swings are absent. One problem common to all underground libraries is how to bring natural light down into their interiors. For the most part, this constraint is overcome through the use of sunken courts and other openings to the surface. In most library buildings, this problem has been solved satisfactorily. A great problem to

architects is to identify the entrance from the exterior. More experience with designing for underground use will refine and identify options. The coming years will be challenging to architects and librarians. Underground libraries may be one solution to the space problem of our libraries in our overcrowded and overurbanized environment.

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Corporate Annual Reports in Academic Business Libraries

Judith R. Bernstein

More than twenty thousand companies distribute annual reports. These reports are collected by libraries in various media, however, an extensive literature search failed to uncover any description of these collection practices. This paper describes a survey of 500 academic business libraries that was undertaken to gather information on present practices in the acquisition, use, retention, and storage of domestic and foreign corporate annual reports as well as on policies related to their circulation and cataloging. These reports, an extremely important body of primary company information, are collected by 92 percent of those libraries responding to the survey. After describing current practices in detail, some options are proposed for libraries collecting this material.

orporate annual reports are widely collected by academic business libraries as excellent descriptions of company activities. The corporate report reviews the past year's accomplishments, and provides a perspective on the future of the company.[1] It is addressed to shareholders and thus is written in language that the average shareholder will understand. It is also an ideal source of information for the business student. In an expensively packaged public relations document, often costing the company thousands of dollars to produce but usually sent free to libraries, the student can get a detailed view of the company's corporate image and policies. The student can see how the company's product is displayed, identify the corporate officers, and get an indication of the type of employees the company hires. Most importantly, the annual report contains a detailed description of the company's financial balance sheet—earnings, sales, stockholders' equity, etc. Nevertheless, nothing has been written about the acquisition or retention of annual reports.

Despite their many benefits, annual reports pose a range of problems for the librarian. The hard-copy corporate annual report (CAR) to the shareholder must be requested from each company. The librarian must see that a request is made, the report is received, and the library *stays* on the mailing list for the following year. Continuous checking on responses to these requests is needed: often a company does not respond immediately and a second request must be generated. If the company is very small, phone calls may need to be made. If guidelines have been established for the library's holdings, these must be reviewed each year so that the list remains current. If selection is by individual companies in a particular industry, the list must be reviewed in order to add new companies and drop old ones.

After a few years, CARs begin to take up a great deal of space; after five or ten years, they present serious storage problems. How much historical information in this form is it necessary for the library to

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keep? If space needs appreciate so rapidly, what is the best location for the CARs? Do questions of currency and security make special locations a requirement? Should they be in an area such as reference or reserve where assistance is normally available? Can older issues be located in more remote areas? Do we know how the reports are used so that we can make intelligent judgements on these issues?

Foreign corporate reports pose further problems. Many foreign companies are not generous in sending out reports and, for some, numerous requests may be to no avail. Often it is necessary to make requests in the language of the country in which the company is headquartered. Many foreign companies do not have any conception of a mailing list, and library staff must request the current reports from these companies annually. The necessity for frequently checking receipts is more critical for foreign annual reports because they may become totally unavailable if missing issues are not noted promptly and claimed immediately.

Some of the problems posed by hardcopy versions may be alleviated by collecting annual reports on microfiche supplied by commercial vendors. Microfiche may be retained for many years and use considerably less space than the original hard copies. The vendor providing the fiche is responsible for maintaining orderly receipts; however, there is a substantial cost for these fiche, and the library will still be responsible for making any changes in the company reports that are to be acquired on the subscription. In the case of foreign corporate reports, there is an added concern: it is only in the last few years that vendors have been in the business of supplying substantial numbers of reports, and we have no track record of their ability to maintain an orderly supply of them.

If the library can overcome the questions of costs, there are still a number of unanswered questions about the use of microfiche. Librarians have always felt that there is a strong reluctance on the part of the client to substitute microforms when paper is available. One consideration is that the "packaging" of the annual report is lost; for example, multicolored graphics are not cheaply produced in microform. How important is the packaging and artistic production to one's clients as compared to those aspects that can be as easily provided in another format?

A possible alternative to the CAR is the 10-K. The Securities and Exchange Commission requires that this report be filed annually by all public companies with at least three million dollars in assets and five hundred shareholders. A few companies use the 10-K as their annual report; others include it as an addition to their annual report, but this is not common practice.[2] There are now several vendors that provide microfiche copies of 10-Ks and related reports on a subscription or demand basis. As with annual reports on fiche, the storage of 10-Ks is considerably less burdensome than the paper CARs, but this convenience may be offset by the substantial purchase costs as well as the need for fiche readers and printers. Questions also remain as to whether the information contained in the 10-K is sufficiently similar to the annual report that one can be substituted for the other in library collections.

THE SURVEY

In order to answer some of the questions raised about corporate annual reports, a questionnaire was sent in March and April, 1985, to 500 libraries affiliated with institutions listed in *Barron's Guide to Graduate Business 1984*.[3] (Schools with fewer than twenty-five M.B.A. students were not included in the survey.) Replies were received from 340 libraries (68 percent), including 5 that did not fill out the questionnaire and 1 that filled out only one side of the two-sided form. A subset was created of those libraries that were identified as having a separate business library by the *College and University Business Library Statistics 1979/80 and 1980/81 Survey*. "The term 'separate' refers to those libraries that are housed in a separate building or part of a building, with a separate budget and an easily identifiable collection of materials."[4] To this subset were added those libraries that were identified by *Barron's* in the Cartter Report as the "top schools of business."[5] It was the author's hypothesis that the separately housed and top schools might have different practices than other academic busi-

ness libraries. Thirty-four separately housed libraries were identified, and 7 additional schools without separate libraries were added from *Barron's* "top" group. In order to increase the percentage of returns, a telephone follow-up was conducted. Of the 41 libraries in this group, 90 percent (37) eventually returned the questionnaire. (See appendix A for a listing of the 37 institutions.)

The survey instrument contains twenty-seven questions. Section I deals with domestic companies: questions 1–7 relate to the acquisition, storage, location, and use of the hard-copy annual reports; questions 8–13 deal with the same data as they relate to annual reports on microform; 14–17 solicit information on the acquisition and use of the 10-K reports. Section II, questions 18–21, contains requests for information relating to foreign corporate reports. Section III contains questions on circulation, cataloging, online services, and proposed changes in annual report collection policies. Section IV solicits background information regarding the size of the library's business collection and the number of students in the graduate and undergraduate business programs. So much confusion resulted over the question of the estimated size of the collection (number of volumes versus number of titles, serials and/or monographs; inability of librarians to estimate the size of an interfiled collection) that this answer was disregarded. Only one question was intended to be open-ended, but many respondents added unsolicited and useful comments. All the responses were examined and coded in the appropriate section, including those that were unsolicited.

Of the libraries responding to the survey, 75 percent (255) collect hard-copy annual reports. The number of reports collected each year range from one to twenty-five in 9 libraries to more than three thousand in 6 libraries. Of these 6, 4 are in the subset of separate and top business libraries previously defined. (This group will hereafter be referred to simply as the subset.) Of the 37 libraries in the subset, 27 collect hard-copy reports; the majority collects large numbers of reports, as would be expected from major research libraries in this group. Of the total respondents, 99 libraries had just begun collections.

The responses to question 4, categories of collecting, are summarized in table 1. The collecting behavior of the subset was similar. Of the libraries collecting the Fortune 500 hard-copy reports or reports of companies headquartered in the state, the preferred locations are the reference department, special alcoves or rooms, or filing cabinets in unspecified locations. Few libraries keep these reports in the current periodical area, the regular stacks, or remote storage. The preferred locations are consistent among both the total respondents and the subset. Of the libraries retaining reports indefinitely, the majority locate them in the reference department or in special alcoves; a minority of libraries retain them on reserve for varying periods.

The largest number of libraries that specified "other" collections mentioned

TABLE 1

LIBRARIES COLLECTING HARD-COPY ANNUAL REPORTS, BY TYPE OF REPORTS AND YEARS RETAINED

Types Collected	Total Number of Libraries*	Years Retained			
		1–2	3–5	6–10	Indefinite
Fortune 500	177	50	91	11	31
Co.'s hq. in state	175	47	79	11	50
Fortune 1000	54	9	24	4	19
Fortune 500 service	82	18	45	7	21
Forbes 500	40	9	24	2	8
NYSE	71	20	26	3	21
AMSE	61	15	23	3	18
OTC	47	10	19	3	14
Co.'s selected by industry	59	17	24	4	15

*Some respondents transfer reports from one location to another after a number of years, which accounts for the discrepancy in the totals.

reports of locally based companies. Other categories added by respondents were those requested by faculty or students and those from companies headquartered in the region (Southwest, New England, etc.), followed by Value Line services, companies recruiting on the particular campus, and reports acquired as gifts. Many libraries indicated that they made selections from the groups rather than acquiring all companies of a particular category (i.e., all NYSE companies).

The use made of hard-copy annual reports is summarized in figure 1. It is worth noting that those who believe the advertising or public relations aspects of the annual reports to be important are in a distinct minority. Other uses for hard-copy annual reports mentioned by a few respondents are for commercial artists to note product displays; for general class assignments, accounting exercises, strategic planning, and technical writing; for noting the CEO's statement and the company's portrayal of itself; and for general investing. In the subset the responses are similar to those of the whole group.

When asked if they would throw away the hard copy if they *theoretically* were able to acquire microforms, 45.4 percent (152 libraries) said yes and 25 percent (83 libraries) said no. Of those who indicated the period of time they would retain hard copies before discarding, the largest num-

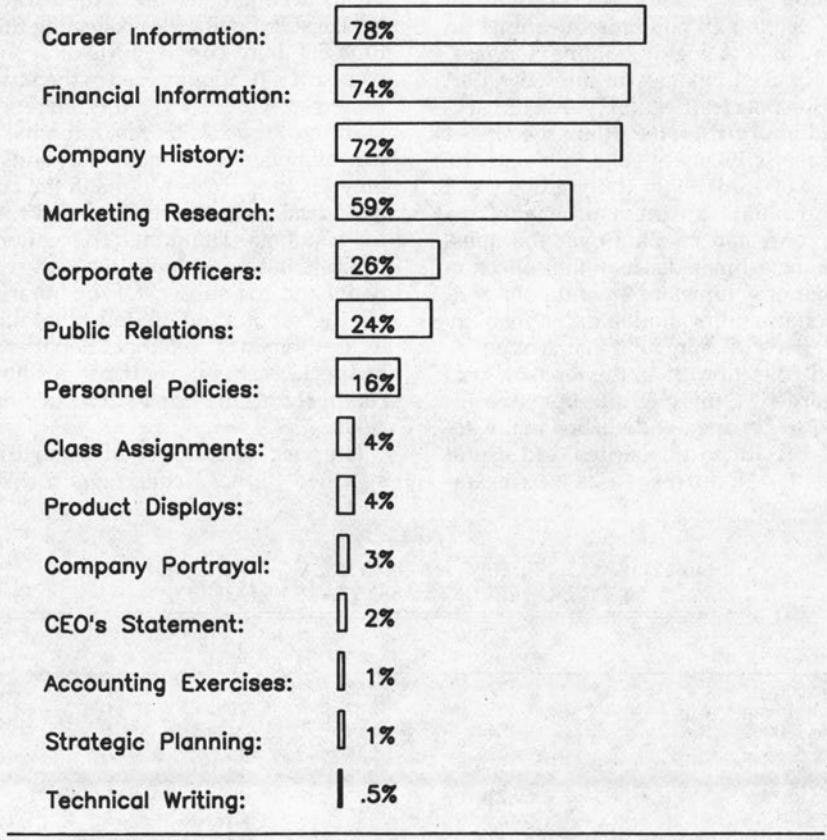

FIGURE 1
Libraries Collecting Hard-copy Annual Reports:
Percentage of Libraries Reporting Use as One of Their Top Four Choices

ber, 25 percent, reported they would discard them after one to two years; 22 percent after three to five years, and 14 percent after six to ten years. When asked what policies they would follow in discarding, 14 libraries indicated they would discard all but their collections of local companies' annual reports—the primary reason given for discarding was lack of space. Of those libraries that indicated they would not choose to discard their hard-copy reports, reasons given were that clients objected to using microforms or wanted multicolored graphics; that microforms were too costly; and/or that there were too few reader printers. The libraries in the subset are closely divided in their decisions to discard. Of those willing to discard, the largest number expressed intent to do so after one to two years (66 percent) or three to five years (47 percent). Several large research libraries keep all material as historical information and indicated that, as large research libraries, they "never discarded anything." Otherwise, the reasons for not discarding are similar to those in the whole group.

In question 9, which solicited information about subscriptions to microform annual reports, 57 percent (191 libraries) reported that they received domestic CARs on microform. In the subset, 86 percent (32 libraries), a substantially larger percentage, collected reports on microform. One hundred nineteen libraries collecting microform reports subscribed to Q-Data for one to twelve years. Eighty-five subscribed to Disclosure Service, having done so for one to seventeen years. Of the subset, 28 libraries subscribe to Disclosure, 9 to Q-Data. Several libraries reported subscribing to the Godfrey Memorial Library's service. The percentage of subscribers to each service is somewhat misleading since some libraries reported on subscriptions that are not currently received.

Of those libraries receiving microforms, 113 reported that in some cases these duplicated their hard-copy holdings. In cases of duplication, the most frequently stated reason for retaining the hard copy was student demand (88 libraries). Only secondarily are the hard copies retained because of minimal overlap with microforms or because of the need for additional copies. The results for the subset are similar, with faculty demand given as an additional reason for retention. A very small number of each group plan to discontinue hard copies. Of the total libraries receiving microform CARs, only 39 percent replied that they currently discard the duplicates after a specified number of years.

The next group of questions concerned the acquisition and use of the SEC 10-K reports. These reports are acquired by 89 percent of the libraries in the subset and 60 percent of the whole. In both the whole and the subset, the largest number of libraries subscribe to NYSE, the second largest to AMSE, and the least to OTC companies. Of those who indicated that they subscribe to a selected group of 10-K reports, the predominant category of selection in the subset is local- or state-headquartered companies. A higher percentage of libraries in the whole group select from the Fortune 500 list, with the second highest choice being local- and state-headquartered companies.

Figure 2 summarizes the results of the questions regarding use of the 10-Ks. Note the difference in perception of career information found in the annual reports and in the 10-Ks. Both groups cited classroom assignments as a significant use and stated that faculty often required a comparison of the 10-K and the annual report. Other uses cited were for information on litigation, subsidiaries, and insider holdings and for assisting the university in soliciting contributions. An overwhelming number of libraries, citing the differences in information in each, indicated that they would *not* use the 10-Ks in place of hard-copy annual reports.

Only 69 libraries collect foreign corporate annual reports (FAR); of these, 23 are from the subset. FARs are selected most often from the Fortune International 500, or from "whatever the library can get." (The latter is probably more an indication of the difficulty of collecting than a lack of a clear policy.) Other criteria given for selecting were by specific country and by specific industry. A small number of libraries select by "major foreign companies," on the basis of faculty requests, and from multinational companies or take

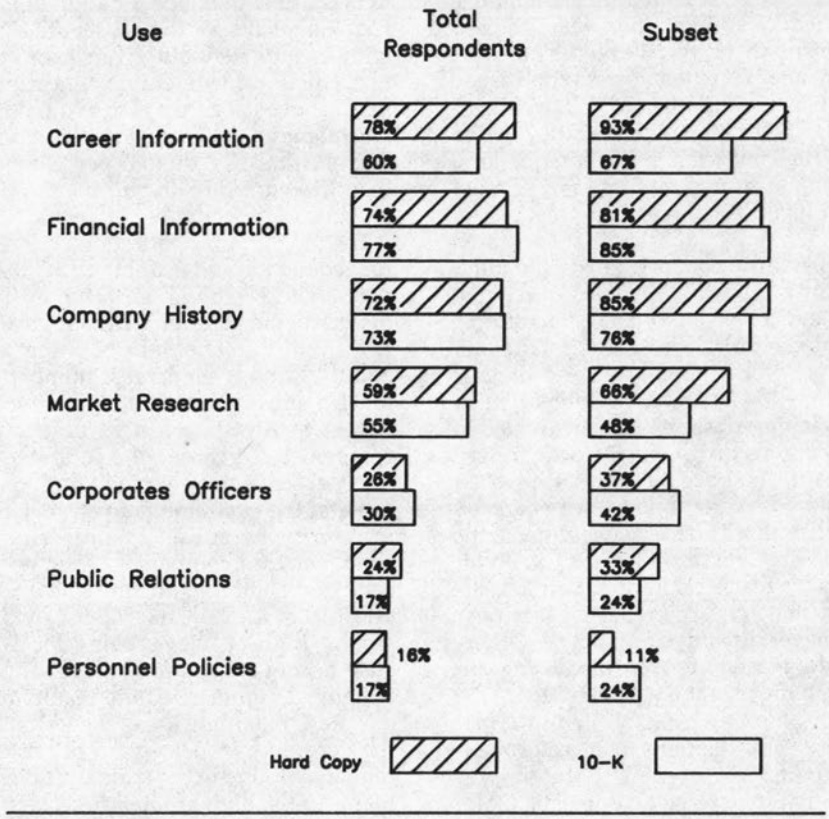

FIGURE 2
Comparison of the Major Uses of 10-K and Hard-copy Annual Reports, as Reported by the Total Respondents and by the Subset (Percentage of Libraries Reporting Use as One of Their Top Four Choices)

those they received as gifts or with their Q-Data subscriptions. As for the number of FARs received, 21 libraries obtain 1–25 per year; 20, 26–100; and 15, 101–500. Of the subset, 3 libraries receive 500 or more FARs per year; 43 of the libraries receiving Fars subscribe to a microform service, 14 of these being in the subset.

In section III, respondents were asked to comment on their circulation and cataloging policies. Libraries were evenly divided between those that circulate their hard-copy reports and those that do not. Most libraries do not circulate their microform reports, although one library circulates both the microforms and a reader. Those that circulate only under special conditions listed them as follows: to faculty or university officials, for a limited time for photocopying, only second copies of reports, overnight, for two hours for classroom use, or only the older, bound reports. The majority of respondents (274) do not catalog their annual reports. Several libraries, however, catalog reports of special groups of companies, such as those from the local/state area or older reports. Several libraries commented on the problems related to the theft of annual and 10-K reports.

One of the more intriguing facts gleaned from the survey was the number of libraries that have online service capability but use it rarely or not at all to retrieve annual report information. Those libraries that commented said that they do not use

it because of the lack of demand, associated with the high cost.

An attempt was made to determine if the size of the M.B.A. population in a particular program had any significance for particular acquisition strategies. The results of this tabulation are found in table 2. It is clear that in the libraries serving larger enrollments, financial ability and/or desire to take each of these types made their acquisitions almost equivalent, with some libraries commenting that the more stringent reporting requirements predisposed them to acquire 10-Ks. In the group of libraries serving the smallest number of M.B.A.'s, the acquisition of hard copy was predominant, the acquisition of 10-Ks considerably less. For the subset, the percentage of libraries taking each of the forms of the domestic corporate reports is so great that the number of M.B.A.'s is irrelevant. There is only one library in the subset that receives neither the microform annual reports nor the hard copy, but it does receive the 10-K's. Most take all three.

Figure 3's parts a and b provide a comparison of the number of libraries holding one or the other form of the domestic report. Note that only 3 libraries take only the 10-Ks. Most significant is that of the 335 libraries answering the questionnaire, only 26 take no corporate reports. This is very small percentage of the total, indicating the importance placed on the information in these reports.

Regarding changes in their current collection policies, 87 libraries planned to make some changes, 21 of these being in the subset. The major proposed change was to collect FARs. Plans to begin acquiring these on microforms were reported by 26 libraries (6 from the subset), and 6 were planning to collect the hard copy. Among other proposed changes listed, 19 libraries (5 of these in the subset) planned to begin discarding hard-copy domestic corporate annual reports, and 14 planned to begin or to increase their 10-K collection (4 from the subset). Ten libraries planned to collect CARs on microform. Other proposed changes mentioned by 1–3 libraries were to begin collecting or to obtain more CARs, particularly from local companies; to cease collecting foreign hard-copy reports and to substitute the microforms mentioned above; to catalog the older hard-copy reports; to change vendors; and to use online services more extensively. One library in the subset planned to store historical material off-site.

IMPLICATIONS

This survey has given us a clear picture of present practices in annual-report collection by academic business libraries. The conclusions given below are based on both the numerical data elicited from the questionnaire and the written remarks of the respondents. There is no major difference in the collecting policies of annual reports in the subset of separate business libraries and the total group except, perhaps in the magnitude of collecting of the major research libraries. One might reasonably conclude that such widespread practices give validation to them in the sense that these practices satisfy the needs of a large number of faculty and students. They also indicate to those librarians who have not yet established policies that these practices have proven useful to a large group of their colleagues.

What can we learn from the survey that

TABLE 2

NUMBER OF M.B.A. STUDENTS IN COLLEGES SERVED BY RESPONDING LIBRARIES; AND LISTING OF TYPES OF CORPORATE REPORTS ACQUIRED

Number of MBA students	Total Respondents	Hard-copy	Microforms Annuals	10-K	Foreign
25–199	131	96	71	66	14
200–399	71	61	37	48	20
400–699	47	32	29	33	9
700–999	19	16	16	17	8
1000 or more	26	20	21	22	12
No answer	41	30	17	15	6
Totals	335	255	191	201	69

Figure 3a: Total Respondents (335 libraries)

Collect 10–K

Collects hardcopy \ micro-forms	Yes	No
Yes	103	57
No	38	3

Do NOT collect 10–K

Collects hardcopy \ micro-forms	Yes	No
Yes	37	58
No	13	26

Figure 3b: Subset (37 libraries)

Collect 10–K

Collects hardcopy \ micro-forms	Yes	No
Yes	20	4
No	8	1

Do NOT collect 10–K

Collects hardcopy \ micro-forms	Yes	No
Yes	3	0
No	1	0

FIGURE 3
Forms of Annual Reports
by Number of Acquiring Libraries

will be of value in both collecting and weeding materials, as well as placing the material for optimum use and conservation of space? While there is always a danger in using descriptive material to make inferences regarding desirable policy, there are some trends that present themselves and some guidelines that can be extracted. One fact is obvious. Company annual reports are such an important source of primary information that every library with an undergraduate business program as well as those with an M.B.A. program should acquire them.

The least expensive means of acquiring corporate annual reports is to write to each company and ask for its annual report. Most will send it free of charge and domestic companies will put the library on their mailing list. One simple method of selecting the companies is to acquire those of the Fortune 500 industrial group; this is the choice of most libraries answering the survey. It would seem equally as important to have the reports of companies that are locally or regionally important available for student use, and/or reports of companies that represent an industry that is of local/regional importance. Companies that regularly recruit at the campus might also be considered for selection, particularly if there is no annual report collection in the placement office of the school. One staff member might be assigned to checking in and requesting the annual reports so that there is a consistent check on their receipt.

If funds are available, it is extremely de-

sirable to order annual reports on microfiche. The library should check all the financial and selection options of each vendor and determine which ones are most suitable.[6] One can order the Fortune 500 on fiche, or the entire list of companies on one of the exchanges, i.e., the New York Stock Exchange, the American Stock Exchange or Over-the-Counter stocks. One may also select companies individually. Again, the merit of selecting state/regional/or locally based companies should be considered. If the area is heavily involved in one industry, then one should consider ordering companies by industry. In any case a specific person should be assigned to review these selections once each year, to make certain that the appropriate companies are added to or dropped from the list. For example, if it is a burden to maintain the changes on the Fortune 500 list, then a regular schedule should be set up to make the changes, say every four or five years. Guides to the companies collected are essential so that library clients will know which company reports they may expect to find.

The study shows that the heaviest use of the hard-copy reports is for career-related information and job interviewing, with company financial and historical information a close second and third. In addition, students clearly demand the hardcopy reports in preference to microforms. At least one to two years of the hard-copy reports should be retained whether or not microforms are taken, and preferably, if space allows, three to five years. In the study, 47 percent of libraries retained their hard-copy for one to five years. After five years, in all but major research libraries, the annual hard-copy reports may be discarded if microforms are available. If the library is unable to budget a subscription for annual reports in microform, there is no clear picture, given by the survey, of how they should handle the weeding of the annual report collection. Certainly the reports of local- or state-headquartered companies should be kept for longer periods than other reports. In the case of libraries that maintain the only copy of such reports in a wide geographic area, there is an obligation to the community to maintain these reports indefinitely. In populous states, it would seem desirable for some cooperative effort to be made to make certain that corporate reports are maintained indefinitely by at least one library.

By maintaining some hard-copy reports for a period of several years, the library will also be able to satisfy the minority of clients who would like to see the company product displays, graphics, photography, quality of paper, etc. Another approach is for the library to acquire a limited number of the corporate annual report winners listed in *Institutional Investor*'s "Best Annual Reports,"[7] or those listed in *Financial World*'s "Annual Report Award Winners." *Financial World* makes awards to those companies that represent "significant overall accomplishment in the conception and execution of an annual report in the past year. Reflecting graphic and editorial considerations alike, the award recognizes more than aesthetic achievement, paying particular heed to the virtues of thoroughness, candor, and clarity of presentation."[8] These reports will allow students to see the best examples of design, graphics, typography, photography, and public relations copy. Each year a list of the acquired reports should be compiled and made available to library clientele.

It appears from the findings that the preferred location for hard-copy reports is in the reference department or in special alcoves. Filing cabinets in the reference department would serve to keep the current reports readily available for student use and also place them where assistance can be given and suggestions made for use. Some thought might be given to placing the latest one to two years in either the reserve or circulation area, for security reasons. Older annual reports might then be placed in less accessible locations. State and local reports, however, might be kept longer in their original location.

In collecting the 10-K reports, funds are an important issue. While there is a clear perception on the part of librarians that the 10-Ks serve an important and distinct informational function in the library, they are *not* essential for every library. Many libraries can serve their student body without the 10-Ks if they maintain some other type of corporate annual report. A limited

number of 10-Ks may be purchased, probably of local or state companies, in order to allow students the opportunity to compare the annual reports with the 10-Ks and to be aware of the different contents of these reports. While the 10-Ks do not satisfy the needs of students for career information as well as annual reports, they can be used to answer the historical and information needs of both faculty and students. (Some 10-Ks do include the annual report as part of the exhibits.) Significantly in our subset, more libraries subscribed to the 10-Ks than to the hard-copy annual reports.

While there is no one solution suitable for all libraries and all academic environments, the ideal mix for all but the large research libraries, would be hard-copy annual reports maintained for at least three years to accommodate those seeking career and job information. The paper copies, except for those related to local or regional companies, would be discarded after this time. Microfiche corporate annual reports would provide a good backup as well as providing the historical information needed. The 10-Ks would be purchased for the New York and American Stock Exchanges, with additions of local and regional companies from the OTC group. If budget considerations preclude buying a complete set of 10-Ks for one stock exchange, selections of local and regional companies of interest could be made. Occasional use of online services could augment the corporate annual report collection.

Those libraries that want a strong program in international management should consider acquiring foreign corporate reports. Because contacting individual foreign countries is labor intensive, a budget for foreign reports on microfiche is desirable. As with domestic reports, inquiries should be made of all vendors as to their services and costs to find the best fit for the library. If the library plans to make direct contact, the Fortune 500 leading foreign companies list may be used or a list drawn up by countries or by industries that are of particular interest to the school. It should be assumed that receipts will not be as complete as one would like, and considerable effort may be needed to see that reports are received. For example, faculty whose work requires extensive contact with foreign companies may be asked to assist in acquiring the reports.

Most libraries do not circulate microform annual reports or 10-Ks. The libraries in this survey were evenly divided as to whether they should circulate hard-copy annual reports. It would appear reasonable to circulate older hard-copy reports that are duplicated either in hard copy or microform and keep more current reports in a noncirculating collection. If the library is the primary state repository for state and regional reports, these should probably not circulate. Annual reports are normally shelved or placed in filing cabinets by company name rather than receiving any cataloging. Access can be through a simple check-in card file or merely by location indicated on a library guide sheet and noted in library location charts. Special reports, or older reports to be retained indefinitely, should be bound for preservation purposes.

The industry supplying various types of annual reports is in a considerable state of flux. New services, new options, new informational combinations are being offered frequently. In 1984, for example, one supplier ceased to provide foreign corporate reports and three other companies entered the field. One vendor is currently offering microfiche annual reports in conjunction with other materials useful for those seeking career information. Another vendor has introduced bonus points for adding to or renewing one's subscription; points which can be redeemed for library equipment. A development still in the formative stage is the introduction of the Security and Exchange Commission's Electronic Data Gathering Analysis and Retrieval System, known as EDGAR.[9] Under the EDGAR system, companies will send their 10-K and related data to the SEC electronically and it will be retrieved in the same manner, presumably by anyone with a personal computer. During the pilot project, which is expected to be completed by 1986, 150 to 160 companies will provide information electronically as well as continuing to supply it in paper format.

One needs to monitor this development to see what impact EDGAR will have on the information available in the 10-Ks and/or the accessibility of that information to the public. It would behoove librarians to keep up with new trends, new vendors and new products offered in this area in order to get the greatest cost benefits for their library and to be certain that the information needs of their clients continue to be met.

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APPENDIX A: INSTITUTIONS IN SUBSET

Bentley College
Boston College
Clemson University
Columbia University
Cornell University
Dartmouth College
Harvard University
Howard University
Indiana University
Massachusetts Institute of Technology
Michigan State University
New York University
Northwestern University
Ohio State University
Purdue University
Stanford University
Tulane University
University of Alabama
University of California at Berkeley
University of California at Los Angeles
University of Chicago
University of Colorado
University of Connecticut
University of Illinois
University of Iowa
University of Michigan
University of New Mexico
University of North Carolina
University of Pennsylvania
University of Pittsburgh
University of Texas at Austin
University of Virginia
University of Washington
University of Wisconsin–Madison
Vanderbilt University
Wake Forest University
Washington University

Research Notes

Economic Joint Ordering of Consumable Items for a University Library

S. K. Goyal

In this paper the problem of joint ordering of consumable items for a university library is formulated. A simple heuristic method is proposed for determining the most economical ordering policy. An example involving two items is solved to illustrate the method.

A modern library consumes a large number of items in its day-to-day operations, i.e., loan slips, interlibrary loan forms, photocopying paper of different kinds and sizes, standard stationery items, order forms, etc. Very often a number of items are procured from a single supplier. For example, our local public library purchases photocopying paper in two sizes from one supplier. The demand for the photocopying paper in the two sizes is fairly constant over time. The problem facing the library management is how to procure photocopying paper in the most economical manner.

Items that are purchased exclusively from a single supplier can be ordered in two simple ways: (1) each item is ordered on its own, and (2) items are ordered jointly.

Whenever a purchase order is initiated, a fixed cost of placing an order is incurred. This fixed cost primarily consists of administrative costs of preparing a purchase order. Some additional cost may be incurred depending on the particular item(s).

Therefore, in the first instance, where each item is ordered on its own, every time an item is ordered the fixed cost of placing the purchase order and the variable cost of ordering that particular item must be incurred. On the other hand, in the second instance, where items are ordered jointly, the cost of placing the order consists of the fixed cost of placing the order plus the total of individual ordering cost of the items included in the purchase order. Therefore, as a result of ordering items jointly, considerable saving in the total ordering cost can be achieved. In the operations research/management science literature, a considerable number of publications exist that deal with the problem of determining an economical ordering policy (see Shu,[1] Goyal,[2,3] Silver,[4] and Kaspi and Rosenblatt[5].)

For the consumable items having a fairly constant rate of demand the Economic Order Quantity Model (EOQ model) is considered to be most appropriate for application in the context of a library inventory of consumable items.

Let

S = fixed cost associated with a replenishment;

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n = number of consumable items ordered from the supplier and for the i^{th} item;
S_i = variable cost of including the item on the replenishment order;
D_i = demand per year;
h_i = stock holding cost per item per year.

In the first instance, where each item is ordered on its own, the EOQ and the minimum annual cost (MAC(EOQ)), for the i^{th} items are given by formulas 1 and 2. The minimum annual cost for all the consumable items is given by formula 3.

In the second instance where items are ordered jointly, let T represent the time interval between replenishments. The order quantity for the i^{th} item will be TD_i. Hence the annual cost, Z, of ordering and stock holding in case of joint replenishment is given by formula 4.

The total annual cost has a least value at $T = T_o$ as given in formulas 5 and 6.

$$(EOQ)_i = \sqrt{\frac{2D_i(S+S_i)}{h_i}} \quad (1)$$

$$(MAC(EOQ))_i = \sqrt{2D_ih_i(S+S_i)} \quad (2)$$

$$(MAC(EOQ)) = \sum_{i=1}^{n} \sqrt{2D_ih_i(S+S_i)} \quad (3)$$

$$Z = \frac{(S + \sum_{i=1}^{n} S_i)}{T} + \frac{T}{2} \sum_{i=1}^{n} D_ih_i \quad (4)$$

$$T_o = \sqrt{\frac{2(S+\sum_{i=1}^{n} S_i)}{\sum_{i=1}^{n} D_ih_i}} \quad (5)$$

$$(MAC(JOINT)) = \sqrt{2(S + \sum_{i=1}^{n} S_i)\sum_{i=1}^{n} D_ih_i} \quad (6)$$

$$(EOQ(JOINT))_i = D_i \sqrt{\frac{2(S+\sum_{i=1} S_i)}{\sum_{i=1}^{n} D_ih_i}} \quad (7)$$

The economic order quantity for the i^{th} item is given by formula 7.

If the total annual cost (MAC(JOINT)) as obtained from (6) is lower than the (MAC(EOQ)) evaluated from (3), then it is more economical to order items jointly.

Very often, the $(EOQ(JOINT))_i$ for some items may be lower than the EOQ when the item is ordered on its own without incurring the fixed cost, S, (in such a situation

$$\left[(EOQ)_i = \sqrt{2D_iS_i/h_i} \right].$$

For these items it makes sense to order less frequently, every second replenishment or every third, and so on. In short, the i^{th} item may be ordered in every K_i^{th} replenishment where $K_i = 1, 2, 3$, and so on. In order to determine the value of K_i, we select the nearest non-zero integer number from the ratio shown as formula 8. See Silver[6] for determining the value of K_i.

The time interval between replenishments, the order quantity for the i^{th} item and the (MAC(JOINT)) are given by formulas 9, 10, and 11.

Therefore, for items purchased from a single supplier, the following steps should be implemented for determining the economic ordering policy.

A SYSTEMATIC PROCEDURE FOR DETERMINING THE ECONOMIC POLICY

Step 1. For each item $i = 1, 2, \ldots, n$, evaluate $(EOQ)_i$ from (1), and (MAC(EOQ)) from (3).

Step 2. Obtain $(EOQ(JOINT))_i$ from (7), evaluate

$$\frac{\sqrt{2D_iS_i/h_i}}{(EOQ(JOINT))_i}$$

and select the nearest non-zero integer as the value of K_i for $i = 1, 2, \ldots, n$.

Step 3. Determine (MAC(JOINT)) from (11), if (MAC(EOQ)) $\leq$ (MAC(JOINT)) then select $(EOQ)_i$ as the order quantity for each item and the policy is to order items individually. If (MAC(EOQ)) > (MAC(JOINT)) then items are ordered jointly.

AN EXAMPLE

A library orders photocopying paper in two sizes from a supplier. The various es-

$$K_i = \frac{\sqrt{2D_iS_i/h_i}}{(EOQ(JOINT))_i} \tag{8}$$

$$T(JOINT) = \sqrt{\frac{2\left(S + \sum_{i=1}^{n} S_i/K_i\right)}{\sum_{i=1}^{n} D_iK_ih_i}} \tag{9}$$

$$(EOQ(JOINT))_i = D_i \bullet T(JOINT) \tag{10}$$

$$(MAC(JOINT)) = \sqrt{2\left(S + \sum_{i=1}^{n} S_i/K_i\right)\sum_{i=1}^{n} D_iK_ih_i} \tag{11}$$

Step 1. From (1):

$$(EOQ)_1 = \sqrt{\frac{2D_1(S + S_1)}{h_1}} = \sqrt{\frac{2 \times 1000(20 + 8)}{1}}$$

$$= 237 \text{ boxes}$$

$$(EOQ)_2 = \sqrt{\frac{2D_2(S + S_2)}{h_2}} = \sqrt{\frac{2 \times 150(20 + 8)}{1.1}}$$

$$= 87 \text{ boxes}$$

From (3):

$$(MAC(EOQ)) = \sqrt{2_1D_1h_1(S + S_1)} + \sqrt{2D_2h_2(S + S_2)}$$

$$= \sqrt{2 \times 1000 \times 1(20 + 8)} + \sqrt{2 \times 150 \times 1.1(20 + 8)}$$

$$= 236.64 + 96.12$$

$$= \$332.76 \text{ per year}$$

Step 2. From (7):

$$(EOQ(JOINT))_1 = D_1 \sqrt{\frac{2(S + S_1 + S_2)}{D_1h_1 + D_2h_2}} = 1000 \sqrt{\frac{2(20 + 8 + 8)}{(1000 \times 1 + 150 \times 1.1)}}$$

$$= 249 \text{ boxes.}$$

$$(EOQ(JOINT))_2 = D_2 \sqrt{\frac{2(S + S_1 + S_2)}{D_1h_1 + D_2h_2}}$$

$$= 37 \text{ boxes.}$$

$$\frac{\sqrt{2D_1S_1/h_1}}{(EOQ(JOINT))_1} = \frac{\sqrt{2 \times 1000\ 8/1}}{249} = 0.51, \text{ hence } K_1 = 1$$

$$\frac{\sqrt{2D_2S_2/h_2}}{(EOQ(JOINT))_2} = \frac{\sqrt{2 \times 150 \times 8/1.1}}{37} = 1.26, \text{ hence } K_2 = 1$$

Step 3. From (11):

$$(MAC(JOINT)) = \sqrt{2(S + \frac{S_1}{K_1} + \frac{S_2}{K_2})(D_1h_1K_1 + D_2h_2K_2)}$$

$$= \sqrt{2(20 + 8 + 8)(1000 \times 1 \times 1 + 150 \times 1.1 \times 1)}$$

$$= \$289.62 \text{ per year}$$

FIGURE 1

$$T(JOINT) = \sqrt{\frac{2(S + \frac{S_1}{K_1} + \frac{S_2}{K_2})}{D_1h_1K_1 + D_2h_2K_2}} = \sqrt{\frac{2(20 + 8 + 8)}{1000 + 165}}$$

$$= 0.249 \text{ years}$$

$$(EOQ(JOINT))_1 = 249 \text{ boxes; } (EOQ(JOINT))_2 = 37 \text{ boxes}$$

FIGURE 2

timates for the problem are given below:

S = \$20 per order

For size 1 : i = 1
D_1 = 1000 boxes/per year
S_1 = \$8 per order
h_1 = \$1 per box per year

For size 2 : i = 2
D_2 = 150 boxes per year
S_2 = \$8 per order
h_2 = \$1.10 per box per year

We apply the three steps to this problem as shown in figure 1.

Because (MAC(JOINT)) is lower than (MAC(EOQ)), the economic policy is to order jointly. The orders are placed at intervals obtained from (9). (See figure 2.) The reduction in cost as a result of ordering jointly

= (MAC(EOQ)) − (MAC(JOINT))
= 332.76 − 289.62
= \$43.14 per year

The percentage reduction in cost

$$= \frac{100 \times [(MAC(EOQ)) - (MAC(JOINT))]}{(MAC(EOQ))}$$

$$= \frac{100(332.76 - 289.62)}{332.76}$$

= 12.96%

CONCLUDING REMARKS

As a result of ordering items from a single supplier in an economical manner, significant cost savings can be achieved. The procedure given in this paper can help in achieving such savings.

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Letters

To the Editor:

The article entitled, "The influence of reference practices on the client relationship," by Joan C. Durrance in your January 1986 issue served to reinforce something we all know. The word "librarian" is generally applied by most people to anyone who appears to be working in a library. It is rare that one would confuse an nurse with a doctor in a hospital. I am not however advocating uniforms. I do believe that as costly as the practice may seem it is absoulutely essential that librarians screen questions. Allowing the least qualified staff member to filter and assign questions is in the same category as allowing a nurse to diagnose an illness, a practice no self-respecting doctor would tolerate. The information desk should only indicate locations to patrons.

SYLVIA SPECTOR LAMONT
Los Angeles Harbor College, California

To the Editor:

James S. Heller deserves the appreciation of the college community for his article "Copyright and fee-based copying services" in the January issue of CRL, where he shares his expertise on copyright law, regarding the copying of materials, with our members. Frequently, specialized articles are printed in specialized journals, thus missing the audiences most in need of the knowledge. The article is clearly written and very informative, especially for the novice.

Heller discussed all the facts needed to comply with the law. Copying service is provided by college libraries and this understanding is needed. He has analyzed sections 107 and 108 of the law and discussed problems involved in what is copied, how much is charged for copying, and for what purposes the copied materials are used, as well as how the collected fees are used. This is a useful article for all college librarians and for others interested in the effects of the copyright law on the copying process. Again, I would like to thank Mr. Heller for making this information available to us.

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Recent Publications

BOOK REVIEWS

Downs, Robert Bingham. *Perspectives on the Past: An Autobiography.* Metuchen, N.J.: Scarecrow, 1984. 225p. $17.50. LC 84-5589. ISBN 0-8108-1703-9.

The distinguished longtime librarian of the University of Illinois is a man whose career, accomplishments, and words have received much deserved respect and attention. Here he offers an accounting of his life, what he calls his *Apologia Pro Vita Mea.*

Downs' career speaks for itself; he need not justify it and indeed he does not apologize at all. Rather he expresses very considerable satisfaction with his choice of a profession and assures us that he has never experienced any doubts about that decision. Asked by a recent biographer whether he had suffered major disappointments or failures to accomplish anything of great importance that he had sought to do, he simply replied that he could think of none. Though many of us who experience self-doubts or, at the least, some regrets that we could not also have tried some other appealing roads may find such complacency odd, the record provides every reason to justify Downs' satisfaction.

With only brief experience in subordinate positions, he headed three important libraries in his early career, starting at Colby College and moving to the University of North Carolina and to New York University before beginning his twenty-eight years at Illinois. At each he was notably successful. Accompanying these principal work assignments were contributions as library educator, as library consultant and resources surveyor in the United States and abroad, as active member and contributor to professional associations, and as prolific author of books and articles dealing both with librarianship and such related topics as folklore, great books, and intellectual freedom.

Surely the personal report of such stewardship promises much of value to those who come after him. The book itself is generously illustrated and printed in an attractive style considerably above the usual standard of this publisher. Everyone in these lines of work will find it interesting—but not fascinating. Downs is not alone among academic librarians in recent years in writing an autobiography that tells us less than we would wish. But Ellsworth, Lyle, Metcalf, Powell, Ready, Shores, and—judging by Martin's report of the source of much of Tauber's ostensible biography—Wilson gave us considerable amounts of personal and private testimony, Metcalf most of all. Downs, unfortunately, lives up to his reputation as a private and reserved man. Not only does he withhold his personal feelings and reactions but he also writes in ways well calculated to put a distance between himself and his reader.

He has chosen to organize the work, not in the chronological fashion in which a life is lived but in topical order: people he has known professionally, administrative positions he has held, research collections he has built, resources he has analyzed, libraries he has surveyed, association activities he has been engaged in, foreign assignments he has carried out, books he has found influential, ideas and events of

intellectual freedom he has involved himself in, folklore he has studied, and personal and family matters. More than a third of the text consists of quotations from articles he has written. Of the first chapter, "People," ten of the twenty-four pages are quoted passages, eight of them from a frequently reprinted speech on his views on supervisory style. The book, all too often, has the character of compilations on the successive topics rather than the firsthand, personal testimony that the reader of an autobiography hopes to find.

In style too, the work has fortunate characteristics. Surprisingly in one who has written so prolifically, Downs frequently commits the fault of the misplaced or dangling modifier, perhaps because of his predilection for the passive voice. Perhaps in response to a wish not to claim credit not due him, he tends not to spell out his own positions in many instances, with the odd and presumably unintended result that the reader, not being told anything of the ebb and flow of discussion, begins to get the impression that every favorable outcome is to be credited to Downs himself. Sitting in my office overlooking Lake Mendota, I can only rejoice that the undergraduate library of the University of Wisconsin was placed in this scenic location. Do I owe that fortunate outcome only to Downs and his recommendation or was it the result of many suggestions? Throughout the book similar ambiguities occur.

Even though this book surely adds to what was made known in Arthur P. Young's chapter in *Leaders in American Academic Librarianship: 1925–1975* (Beta Phi Mu, 1983), nothing in it impresses one as being new or different. The unique contribution Downs has to make to the story is only briefly made here. His disclaimer—that he intends to write only a professional biography—does not entirely satisfy the need for candid assessment of persons and events, if indeed we are to learn as much as we might from his experience. He lists, for example, a number of the departmental librarians at Illinois and he omits others. Does the difference have any particular significance? Does it represent a variation in his judgments of people or is it solely a function of space? He lists some chief librarians of major universities and omits others contemporary to them. What is the meaning of those differences? His discussion of the Center for Research Libraries provides one illustration of the substance that is missing. For better or for worse, the center surely represents one of the most imaginative conceptions of the past half-century. Downs briefly expresses reservations about the institution. It would help the rest of us to know more of the professional and even the personal considerations that lie behind these brief remarks. He provides a reference to a paper published some thirty years ago, but a contemporary discussion and a retrospective evaluation would surely help us. In this connection appears one of the many ambiguous passages in which, though Downs does not claim credit for an outcome, a reader might reasonably conclude that it is due to him: "When I was chairman of the MILC Board of Directors . . . I proposed a name change: the Center for Research Libraries, and the recommendation was accepted. Afterward, a large number of U.S. libraries outside the Midwest and in Canada became members" (p.35). The sea change in the institution symbolized by this revision of the name is a topic that warrants detailed exposition, and, if Downs indeed developed the idea as well as the name to express it, he deserves great credit or perhaps blame. I suspect the matter is considerably more complex than this passage suggests and I feel some confidence that Downs did not intend to claim either credit or blame. But, since he does not tell us, we do not know.

It is not a happy situation to be critical of the work of one who has so clearly merited much or perhaps all of the praise he has received. Yet one could wish that the writer of an autobiography would tell us more that is direct, explicit, and candid. We have much to learn from the career of Robert Bingham Downs. The public record of that career is masterfully marshaled here. A great deal of it, however, was available before, and the unique contribution he had to make to the story is only briefly made. There is almost nothing that is truly personal or even, except in the literal meaning of the word, autobiographical.—

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meaning of the word, autobiographical.—*W. L. Williamson, Library School, University of Wisconsin–Madison.*

Cleveland, William S. *The Elements of Graphing Data.* Monterey, Calif.: Wadsworth Advanced Books and Software, 1985. 323p. $18.95 LC 85-10603. ISBN 0-5340-3730-5.

The only negative thing that might be said in connection with this book is that it probably won't be read by even a fraction of the scholars who could benefit significantly from exposure to its content. Cleveland's insights and principles go far beyond the relativity simple problem of creating legible graphics; as he writes in the preface: "This book . . . contains graphical methods and principles that are powerful tools for *showing the structure of data*" (p.1, my italics).

Like maps (with which I am most familiar), graphs are made for two quite different reasons. The first is data analysis, for which the scholar uses the graph to tease out or make explicit relationships among observations for his own benefit. The second is data communication, for which the scholar-analyst has determined what the structure of the data is and wants to communicate it effectively to others. Thus a graph can be both an intermediate working tool and a final product, uniquely efficient for both, superior in many instances to words, numbers, or (even) maps. But in the formal educational curriculum at all levels (including college and graduate school) there is an almost overwhelming bias in favor of acquiring and conveying meaningful relationships among data in verbal or numerical form. Cleveland's book forces one to realize what a serious loss this is for scholarship, even for our culture as a whole.

The Elements of Graphing Data is to graphs what Strunk and White's *The Elements of Style* is to text; high praise is implied and intended in this parallel. Cleveland's writing style—clear, concise, orderly, authoritative, and commonsensical—suggests that he has more than a passing aquaintance with Strunk and White's classic volume. The publisher has also done well by Cleveland, with attractive, legible type, and a generally well thought out book design.

As to content, the book contains four major sections. The first is a brief introductory discussion about graphs, with an emphasis not so much on their form per se (although he integrates knowledgeably the subject of visual perception with all aspect of graphs) as on the meaning that data can take on in graphed form. Cleveland, a scientist at AT&T Bell Laboratories, has been studying (and inventing) graphical methods for data analysis and presentation for more than ten years.

The second section is a how-to gem, "Principles of Graph Construction." It should be required reading for all educated human beings.

The third section deals with graphical methods and moves at times quite deeply into the domain of statistics. The nonspecialist can easily browse through this section, taking as much as seems useful.

Throughout the book Cleveland uses real data sets to illustrate copiously his discussion. This has the effect of making the book a fascinating read because he delves into actual scientific questions, e.g., do hamsters who hibernate more live longer? In one case study, Cleveland reviews the complete 1980 volume of *Science;* the majority of articles (67 percent) contained graphs, almost four hundred in number. Nearly one-half of these graphs were flawed, one-third seriously so (something on the graph was not explained, for example). Cleveland's own illustrations (computer generated) are numerous and clear.

The book closes with an admirable exposition of the principles of graphic perception and cognition that bear on the construction and comprehension of graphs. In some respects it might have been logical and useful for the book to begin with this material, but it probably does take on additional meaning after one has thought intently about graphs for more than two hundred pages.

This book is a gem. Buy it, read it, and urge everyone you know whose job it is to convert raw data to meaningful information to do the same.—*Barbara Bartz Petchenik, Cartographic Services, R. R. Donnelley & Sons, Chicago, Illinois.*

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Cleveland, Harlan. *The Knowledge Executive: Leadership in an Information Society,* New York: Dutton, 1985. 263p. $18.95. LC 85-4442. ISBN 0-525-24307-0.

What are the qualities essential for leadership in the next decade? How will the "informatization of society" (Cleveland's phrase) change the way we work and communicate? Can social and educational institutions change rapidly enough to keep pace with technology? These questions are all too familiar by now. As Cleveland acknowledges, "in a remarkably short span of years—the 1970s and the early 1980s—the once prescient notion that industrial society was being transformed into a postindustrial, 'information,' or 'knowledge' society has become a cliche."

Beyond the superficial discussions of information and technology, complex issues are still waiting to be explored. The premise of *The Knowledge Executive,* a new definition of leadership based on the restructuring of social relationships within an information rich society, seems to promise new insights. Unfortunately, Cleveland delivers little more than a series of generalizations, loosely interwoven with personal anecdotes and quotations from familiar figures. His analysis of information begins with the crucial distinction between symbols and tangible goods, between the inherent limits of natural resources and the exponential expansion of information. He points out the advances in information transfer and briefly discusses how these have affected our concept of owning, copying, and storing data in all formats. All too soon, however, the focus shifts to Cleveland's personal experiences, and an anecdotal deluge swamps any budding theory of information. By the end of the book, the reader will know a great deal about the author's varied career but very little more about the issues outlined in the introduction.

Cleveland does discuss the characteristics of his ideal knowledge executive at length, although not necessarily with any real depth. Those who aspire to be "get-it-all-together people," as Cleveland terms them, must first and foremost be generalists. Attitudes are more important than specific skills, and a liking for "process" seems to be essential. In addition, knowledge executives will share certain concepts such as "the notion that crises are normal, tensions can be promising, and complexity is fun; a realization that paranoia and self-pity are reserved for people who don't want to be executives; and a sense of personal responsibility for the situation as a whole."

Probably the most thought-provoking aspect of the book is what it leaves out. The storage, retrieval, and dissemination of information are central to the mission of libraries. Almost all of the information issues discussed in *The Knowledge Executive* are exemplified in today's library systems. The extent of the future gap between information rich and information poor may ultimately depend upon the expansion or contraction of free library services. Nevertheless, Cleveland does not mention a word about libraries in his entire presentation. This, of course, is an oversight he shares with many who write about the fu-

ture information society. If libraries are indeed fulfilling their information mission, why do they have so little impact on published views of the future? This is a question that *The Knowledge Executive* does not even consider. Perhaps those concerned with the future of libraries should give it some thought.—*Mary J. Cronin, Loyola University Libraries, Chicago, Illinois.*

Costing and the Economics of Library and Information Services. Ed. by Stephen A. Roberts. London: Aslib, 1984. 349p. £20. ISBN 0-85142-176-8.

I am interested in how the falling cost of electronic systems may change the cost structures of libraries and so cause us to rethink how libraries function. I think of cost as a measure of the resources, human and otherwise, that are committed to a particular activity. When libraries commit resources to electronic systems, will the electronic activity so enhance library services that the library will receive a net increase in resources when it adds the electronic system? Or will the electronic system largely represent a shift in resources from conventional activities? I look to a study of library costing to shed light on this issue.

I am aware that academic libraries have competition. Most faculty members subscribe to some journals privately, buy and hold books personally, correspond with colleagues, and send and receive working papers. Often, departments have libraries—some just subscribe to a newspaper or a few journals; some are quite large and formal. Academic libraries themselves may operate as a single facility or as a constellation of libraries with some organizational superstructure. I would like to know what mix of private and collective action is best; what balance of central and distributed facilities achieves the highest level of net benefit? What is the total cost of information flows under each different pattern? What are we willing to pay for libraries under each pattern? Will electronic systems change the relative cost advantage and the pattern of willingness to pay for one pattern over others?

I turn for advice to the collection of essays under review. The questions I pose are difficult and will not yield quickly to systematic investigation. I will find satisfaction if the volume provides sound guidance on how to address these questions.

There are some glimmers of insight here. Ross and Brooks' essay "Costing Manual and Computerized Library Circulation Systems" (1972) measures time (a resource) under an existing system and forecasts how much time will be required under an electronic system. They look at user time as well as library staff time, and so gauge willingness to pay as well as implementation expense. One would like to know the outcome. Now that electronic circulation systems are commonplace, why not report a before-and-after evaluation or a comparison of a library that has a manual system with one that has an electronic system? At least there is sound guidance as to method in the essay presented.

Bookstein's "Economic Model of Library Service" (no source is given for it) also has some good ideas. At an abstract level, the essay identifies a balance between cost and willingness to pay. Its strength is in identifying alternative decision-making regimes. It would be interesting to see these ideas made more concrete. If electronic systems are likely to be fee based while print remains with zero incremental charge, how will libraries evolve? Is such an evolution desirable?

Raffel's essay, "From Economic to Political Analysis of Library Decision Making" (1974), is useful. Conflicting interests will be resolved differently when consumers shop with dollars than when they shop with votes or influence. Willingness to pay depends on who's paying. I suspect, however, that who's paying is usually clearer than Raffel intimates. Libraries are often found in hierarchical environments where conflicts can be resolved at modest cost. In any event, analysis may narrow the scope of conflict.

Line's "Psychopathology of Uneconomics" (1979) is a light but wise essay on the foibles of library managers when confronted with changing costs.

Overall, however, this 347-page book is disappointing. Many of the essays are old. The median publication date of the articles

is 1974. Several of the early essays mention punch-card based systems; none of the essays mention the possible use of spreadsheets as analytic tools. Some of the essays contain unit cost estimates for particular tasks, but these are denominated in currencies of a particular time that are difficult to compare to other times and places.

An issue of importance in assessing cost is when and how to allocate overhead costs to particular functions. Several essays muddle this issue, and no clear sense of it emerges. Perhaps the editor could have commissioned an essay or searched more widely to find an appropriate discourse on this subject. Several of the essays would be clarified by careful consideration of how to treat overhead.

The economic analysis here is sometimes shallow. Rowe's "Application of the Theory of the Firm to Library Costing" (1974) presents the idea of an optimal size of a library. It's an interesting concept, however, one gets no help in understanding why there may be an optimal size, and so there is no guidance offered as to how one might discover whether a library is too large or too small.

Ultimately, one's view of cost analysis should depend on one's goal. If one is interested in managerial efficiency, one may be interested in the details of cost accounting. One might address the question, could manager *X* perform as well as manager *Y* but with fewer resources? One will probably want to omit consideration of overhead outside the manager's control. One will be interested in work flows and timing individual tasks. Although this volume includes some discussion of work-flow measurement, it does not extend to the point of evaluating managerial efficiency. If one has a broader goal—a goal of understanding how costs may vary under organizations of different design or under different technologies—one will require more powerful techniques that are not considered in this volume. Because I am more interested in the larger questions of the cost structure, I get little satisfaction from this book.—*Malcolm Getz, Jean and Alexander Heard Library, Vanderbilt University, Nashville, Tennessee.*

Poole, Herbert L. *Theories of the Middle Range.* Norwood, N.J.: Ablex, 1985. 159p. $29.50. LC 84-28402. ISBN 0-89391-257-3.

Poole's work argues the benefits and outlines the process of extracting middle-range theory from the library and information science literature. An extremely earnest style, heavily laden with sociological theory and philosophical formalisms, is immediately apparent in the text and is a constant reminder of the Ph.D. dissertation origin of this book.

As part of an introduction and justification of a need for theory, Poole cites authors who find a crisis of several parts within information science. Some feel that the field has no definition, others that its researchers lack meaningful direction. For some there are feelings that information science lacks legitimacy in the eyes of other disciplines because of its shaky and not particularly exclusive knowledge base. Poole and his authors suggest that librarians writing within the field may not be sensitive to this crisis because of the nature of library training and the library work place. Librarians in their view are busily service oriented, think in overconcrete terms, and do not seem to absorb the critical research design habits of their faculty customers—nor are they particularly well rewarded for those efforts that they do finally see to print.

Poole and his authorities are certainly aware and very critical of librarians' publications, particularly some use studies. They judge many of them to be attitude surveys, exhortations to diligence, isolated case reports, ill-planned statistical compilations, and the like. Poole believes that this state of affairs will persist in the profession and literature unless theory is used to organize and legitimize inquiry.

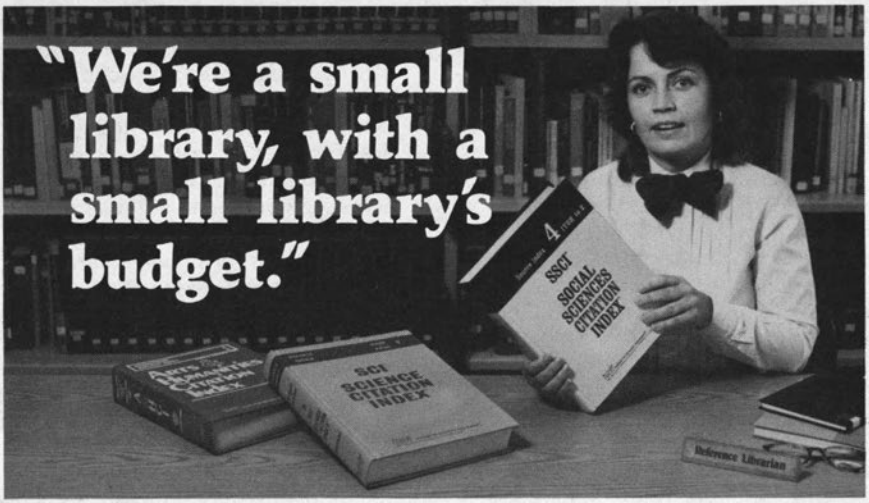
Poole is clear in what he expects of theory and of librarians/information scientists (hereafter, librarians). His grounded, middle-range theory will explain and predict information behavior and will even help to control and shape it. His type of theory is not top down, grand, or all encompassing, but is built upwards from factual particulars and has an intermediate domain of explanation. Poole expects

the enlightened librarian to stop thinking only in compartmentalized fashion and to start thinking on a higher plane of abstraction where connections between seemingly diverse phenomena can be recognized. Enlightened librarians will no longer document isolated behaviors as an end in themselves but will now look for research opportunities that will advance theory.

Ironically, Poole hopes to introduce the reader to his method of theorizing from a reworking of findings from the use studies he condemns. Documenting and discussing virtually every procedural option, marching the reader through the weeding out of this or that type of study, Poole presents as complete a baring of his thought processes and as extended a treatment of the sources for his ideas as the most critical reader could ever want. Poole's eventual procedure was to write a summary of each study in his sample. He indicated which "abstract information use concepts the data seemed to embody." He then works up a formal proposition in sentence form. A summary might mention: "Low use of a card catalog was due to the difficulty experienced by patrons in getting to the library from their offices." The conceptualized propositional statement might be: "Information channel use is an inverse function of perceived cost." While the working librarian might find this transformation a bit strained at first glance, Poole shows that when a seemingly different incident is subjected to this same treatment, a higher relationship can be discovered between the two incidents. An example might be the findings of a study that shows that less experienced scientists prefer simpler indexes, even when more complicated indexes might actually cover more material. Here the enlightened librarian can see that an index, too, can be an "information channel," and that those channels that are difficult to use (have a "perceived high cost") will see less use (an inverse function). Poole works through eleven examples and goes on to provide a good deal of tabular material on the frequency of some concepts and propositional statements. He then examines those that are frequent enough and are sufficiently well documented for possible "theoretical import." Poole then outlines his options for a resulting "middle ground" theory: least effort, pain avoidance, and combination least effort/pain avoidance. While it is arguable that these theories are testable and grounded in fact, it is not clear that the librarian portion of information science will refocus their working lives and research efforts around them. Moreover it seems unlikely that librarians will gain the respect of chemists or physicists in announcing that these theories formed some of the basis of information science. (I do not doubt that a sociologist might be impressed). Of course Poole is only working up the theory that can be specifically based on his sample of articles, but these meager results seem so obvious and so above "middle" ground in terms of generality as to leave the reader feeling unrewarded for his or her considerable efforts in making it to page 89 to arrive at these conclusions. Indeed in this book-length version of what might very well be a dissertation with an important message about seeing the forest, not just the trees, most readers will probably get prematurely tired of chopping all that wood. Or, in Poole's terms, use of this information channel (by working librarians at least) will be inversely proportional to its cost in pain. Of course exceptionally devoted information thinkers like Poole might well reply with yet another "middle range" theory: "No pain, no gain."—*Tony Stankus, Science Library, College of the Holy Cross, Worcester, Massachussets.*

Haas, Joan K., Helen Willa Samuels, and Barbara Trippel Simmons. *Appraising the Records of Modern Science and Technology: A Guide.* Cambridge, Mass.: MIT, 1985. 96p. $9 ($7 to SAA members). (Dist. by the Society of American Archivists.)

For archivists, the concept of documenting a discipline is a vastly different problem today than it was a hundred years ago. The volume of material at hand is, for once, masses more than is necessary rather than less; the disciplines to be documented have changed as well. The fact that archivists are thinking in terms of



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"documentation strategies" reflects the new concern. As is now apparent, in order to develop even documentation of a subject, the archivist needs to take a hand in the creation, selection, and disposition of the records.

This work follows on the heels of *Understanding Progress as Process,* the final report of JCAST, the Joint Committee on the Archives of Science and Technology, published in 1983. Recognizing the new and powerful role of science and technology in modern society, JCAST evaluated the state of the corresponding historical documentation. The upshot of the report was that these areas were not being adequately documented and, thus, the committee recommended recourse for reconstructing the information. *Appraising the Records of Modern Science and Technology: A Guide* is in effect a response to the JCAST report, offering techniques to improve deficient archival skills. The particular tool that is treated in this volume is that archival function upon which all others are based: appraisal. Facility with it provides the framework for deciding whether to acquire a collection or not, how to process the materials and for records managers, assistance with setting retention guidelines.

The authors certainly know whereof they speak. Helen Samuels was a member of the original JCAST team; she and her colleagues Haas and Simmons partially constitute the archives staff at the Massachusetts Institute of Technology, a major scientific and technical university. From that base, they carried out research for the *Guide,* consulting with members of the scientific, engineering, and archival professions. While Haas and the others readily admit their primary experience is with academic archives, they have tested the *Guide* in such a way as to provide a resource that has applicability in government and industry archives as well.

The *Guide* is intended for use by archivists and is based upon traditional archival principles and practices. With that as a framework, the authors identified the component activities of science and technology and described their processes. The authors theorize that they will "demystify" the subject if they are able to describe it, although they admit that the process is "rarely neat, orderly and predictable." The *Guide* describes, for example, the concept of research and development, what activities compose this, and what records are generated from it. The other areas similarly treated are personal and professional activities, the administration of research and development, and the dissemination of information. By way of explaining the absence of precise appraisal guidelines, the authors remark that [although] "we may long for absolute and easy answers in appraisal . . . there are none because appraisal is carried out in specific institutional settings where space, staff and resources and particular subject interests temper all decisions."

One of the successes of the *Guide,* as well as the significance of "documentation strategies" for other subjects is the degree to which original records are perceived as a part of a larger whole. This broad approach requires the archivist to consider all formats of information available (artifact, papers, published material, oral or audiovisual) when deciding what to retain. A particular strength of this guide is its capacity to suggest when the published and thus more readily obtainable material is sufficient, to recommend when only the original documents will do, to specify when preserving a scientific instrument would be helpful, and to outline when the archivist must actually create a record in order to complete the documentation. Of course the net result of this is improved documentation for all purposes.

Although the authors state that the *Guide* is only a starting point, it is indeed a very important starting point. It broadens the technical literature for archivists, and it reminds us of a collecting responsibility we have for science and technology. Finally, the *Guide* encourages archivists to work in consort with librarians and museum curators. If we view our responsibility as a joint one, in the long run the past will be much more soundly documented.

The attractively designed volume is illustrated and has a short bibliography at the end. In addition to its full index, the *Guide* also contains a comprehensive and

useful list of discipline centers. Although they are primarily in the science and engineering fields, the centers are fine examples of the success and logic of "documentation strategies."—*Elizabeth C. Stewart, Folsom Library, Rensselaer Polytechnic Institute, Troy, New York.*

Neway, Julie M. *Information Specialist as Team Player in the Research Process.* Westport, Conn.: Greenwood, 1985. 194p. (New Directions in Librarianship, No.9). $29.95. LC 85-5488. ISBN 0-313-24508-8.

Using a case study approach, Julie Neway examines information services established in nonlibrary environments and serving staffs from such diverse fields as business, the social sciences, and both the pure and applied sciences. Under the auspices of a variety of funding sources, information services were tailored to meet the special needs of the target groups and were determined by direct interviews and other forms of information-need assessment. Quite frequently services included SDI, database searching, and document delivery.

The author, an advocate for proactive librarianship, provides a rough methodological framework for service development and implementation. She believes that establishment of such services may be crucial to the survival of this profession. In essence, Neway argues that information specialists, i.e., librarians, be attached to research teams in order to improve their individual or collective performance.

Significant portions of the monograph are based upon the author's doctoral dissertation (University of Illinois at Urbana-Champaign, 1982). As such, the narrative is heavily footnoted, reflecting the extensive literature review common to the medium. The book is organized into eight chapters with accompanying index and bibliography. The majority of the text is devoted to histories of specific services. The length of these descriptions varies greatly. Most noteworthy is the review of Neway's own experience with the Department of Microbiology at the University of Illinois at Urbana-Champaign. For roughly one year in the early 1980s, the author assessed the impact of an information scientist's presence as a member of the research team. The study included a user evaluation of provided services. Use of a control group allowed the author to determine changes in information use behavior.

Undoubtedly aided by her background in biology, Neway became well integrated into the scientists' environment, attending weekly lab meetings, assessing individual information requirements, evaluating computer-based literature searches, and the like. The service required nearly twenty hours per week in order to fulfill the information requirements of approximately forty scientists. Nearly four hundred information requests resulted in about twenty-five hundred documents delivered at an average cost of $5, which included the salary of the information specialist. The information-use habits of the control and experimental groups manifest some interesting contrasts. Neway observes that the scientists favored with the service spent less time skimming or browsing in favor of reading requested materials in depth. Also, this same group apparently spent less time in discussion with their colleagues.

This monograph encourages librarians to develop advanced information services based upon client-articulated need. In this sense, she shares common ground with certain elements of both the bibliographic instruction and collection development movements that have significant numbers advocating elaborate outreach or liaison activities.

The book wisely reviews service failures as well as success. Additionally, the author provides a useful review of the literature of information-use behavior of various disciplines and professions. Unfortunately, it remains unclear why so many apparent useful information services cannot attract ongoing support. Cost, of course, is a factor since the services described are not without significant fiscal impact. One wonders if any university would absorb the cost of such services if they were extended to the entire faculty. More important is the question of benefit. Current management science often re-

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quires us to measure our performance. Will we ever be able to establish a cost/benefit relationship between our new services and such academic output measures as scholarly productivity, grant production, or enhanced teaching?—*Ed Neroda, Eastern Montana College Library, Billings.*

Nos Ressources Humaines: la Clé d'un Bon Service. Personnel: Key to Successful Public Service. Textes des communications de départ pour les ateliers au 16e Congres de la C.B.P.Q., du 23 au 26 Mai 1985 a l'Auberge du Mont Gabriel. Ed. by Réjean Savard. Montreal: Corporation des Bibliothécaires Professionallels du Québec, 1985. 168p. $20 (Canada).

Reading this work conjures up images of a graduate school seminar course in which students distribute their term papers to one another for purposes of class discussion. The papers vary greatly in length, quality, readability (of both typeface and style), and depth of thought. Writes editor Réjean Savard in his preface, "We have sacrificed aesthetics for efficiency by printing the texts as they were submitted by contributors. We have done this to make the papers available *before* the conference" (p.xi). Such an arrangement makes sense for the conference attendees. And, given the notorious time lag associated with the publication of conference proceedings, it is a breath of fresh air to be able to read these contributions just a year after they were presented. Having said that, however, the lack of uniformity results in an inferior product, not only typographically but in other ways as well, evincing an acute lack of what one expects of careful editing. The lead article, for example, one of six French-language pieces (of fourteen contributions, not counting the preface, which appears in both English and French), is word processing with a justified right margin but printed on a low-resolution dot-matrix printer, off-putting for English-language readers on at least two counts.

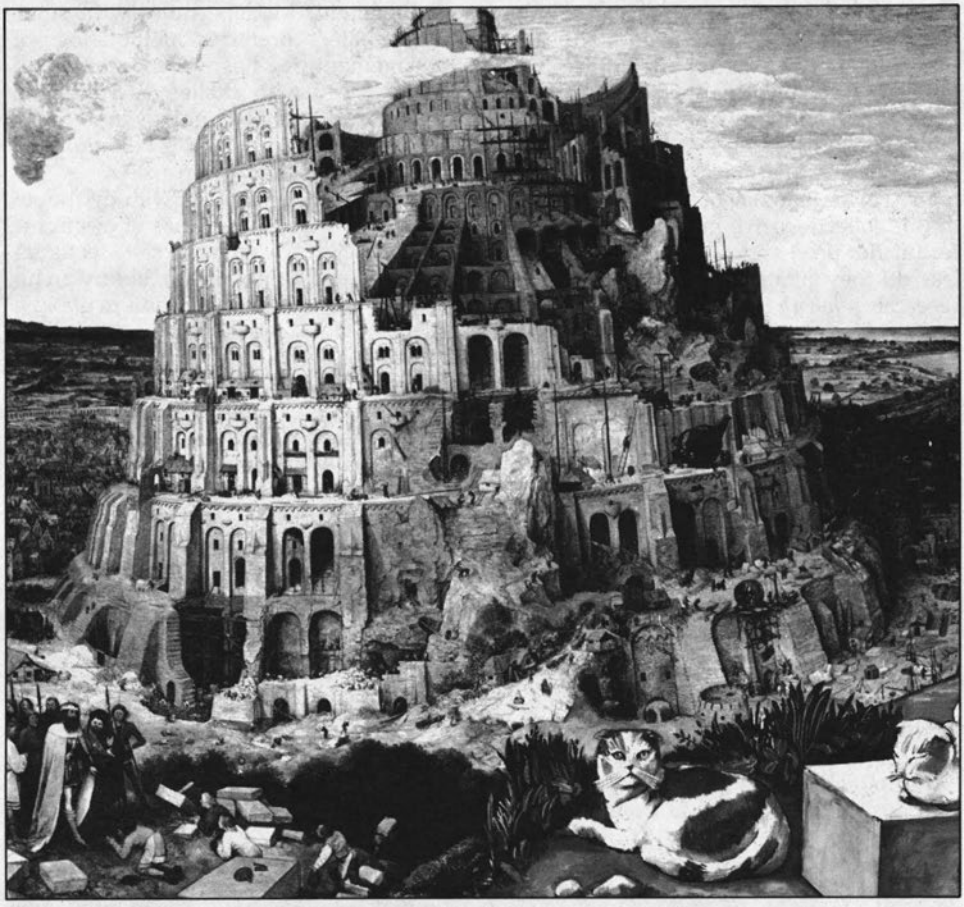
Topics covered in the collection range from professional education to conflict resolution to team building and unionization. Of particular merit are contributions by Kathleen M. Heim, Les Pourciau, and Diane Mittermeyer.

In a carefully written, upbeat article, Heim explores further one of her familiar research interests, gender stratification. Before tracing the historical context of women in libraries, she notes that "on the whole the library profession offers a far greater opportunity for balance between the sexes than do other professional arenas" (p.32). In her historical overview one is struck by the relative recency of the movement to expose the lack of parity between men and women in administrative library positions. In conclusion, Heim suggests ways in which sex discrimination can be ameliorated, noting that a victory in the comparable-worth battle will benefit librarians of both genders.

The application of one particular conflict resolution technique to resistance to change is the subject of Les Pourciau's paper. Granting that resistance to change is a natural reaction, Pourciau focuses on the use of the integrative decision-making technique to mitigate conflict between persons initiating change and those resisting it. Distinguishing among the various types of conflict, he reviews the traditional approaches of management to resolving conflict, rejecting separation, affiliation, annihilation, and regulation as inappropriate for the work milieu of libraries and settling on interaction as holding the most promise.

Diane Mittermeyer's interest is professionalism. She presents a number of models of professionalism, ranging from what she labels outmoded to all-inclusive. Mittermeyer notes that use of the trait model—in her view largely discredited—is still common among authors of library literature, though it is now used more critically. Other models, such as the field specific, are receiving more attention. Mittermeyer argues that whatever paradigm of professionalism is considered, librarians should pay increasing attention to their use of political power strategies as an important element of social recognition. Whether this strategy should be used to enhance power, as she suggests, is a matter of some debate.

Some of the other papers are marked by a lack of vibrancy and timeliness. The



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reader plows through the article on flex time (a topic whose vitality peaked some years ago) only to learn that empirical studies show flex time to have a generally positive effect on morale, though library-specific studies result in inconclusive findings. Such findings are hardly worth the time and energy expended. The piece relating to the development of an internship program was long on news and institutional boosterism, but left the reader little to ponder. And that's the disappointment. Fewer than half of the contributions in this collection give much to tuck away for further professional discussion; much less do they pique interest in additional research.—*Jonathan D. Lauer, Aurora University Library, Aurora, Illinois.*

Issues in Academic Librarianship: Views and Case Studies for the 1980s and 1990s. Ed. by Peter Spyers-Duran and Thomas W. Mann, Jr. Westport, Conn.: Greenwood, 1985. 206p. (New Directions in Librarianship, No. 7). LC 84-15733. ISBN 0-313-24645-9.

Addressing the conflicting issues and priorities raised through the impact of social and technological change upon academic and research libraries is always a difficult task. For the vast majority of the professional literature, one or two aspects of this process are emphasized or presented in detail. The editors of this volume have done all library personnel a significant service by collecting fourteen papers given at the conference on "Contemporary Issues in Academic and Research Libraries" held in Boulder, Colorado, February 28–March 1, 1984. Taken together, they provide a clear picture of a tangled subject. The administrative viewpoint is visible throughout; as many of the authors are themselves in senior administrative positions, this is understandable and logical.

The opening essay by David Adamany reviews the position of research libraries as seen from the perspective of a university president. Due consideration is given to matters requiring presidential input, such as recruitment, budget planning, creation of a development plan, and personnel evaluation. In their respective papers, Runyon, Frank, and Dupuis further explore various types of strategic planning and their effects on situations as varied as Texas Tech University, Quebec cooperative development, and general library management. McCabe notes with some regret that "a preferred methodology of management . . . has not yet appeared" (p.27). Faced with challenges stemming from an exploding technology in virtually every area of information production and storage, this is hardly surprising.

It is this challenge dealt with by the remaining papers in the areas of electronic publishing, public sector/private sector interaction (and competition), library architecture, optical disks as a medium of preservation (as contrasted with more traditional forms and techniques), and computer literacy. Robert Zich's paper on the Library of Congress optical disk project and James Hart's case study of teaching computer literacy at the University of Cincinnati are particularly useful for summaries of current practical approaches to two frontier areas of preservation and instruction. Equally useful is the analysis of the public sector/private sector controversy presented by Glyn Evans: an especially noteworthy feature is a brief background history of the federal and professional reports issued on this topic. Library schools and the type of librarian needed in the brave new library world of the 1980s and 1990s are examined by Boyd Rayward, with emphasis laid upon practical implementable research utilizing the very technologies that pose such opportunities for the profession. Opposed to this is Edward Reid-Smith's call for increased user education so as to create a greater degree of self-sufficiency or "informatacy," permitting professional personnel to be better used. Finally, the idea of professionals as faculty is summarily dealt with by Fred Batt, who advocates making such ranking an option for academic and research library personnel, rather than saddling them with duties potentially detrimental to their effective functioning.

While some of the issues discussed in this collection have been more fully treated elsewhere in the literature, the papers here do serve one extremely impor-

tant function. This is to provide a picture of developmental trends at the interface between library user, librarian, and the new technology, which gives ample weight to maximizing possibilities for all three.—*Robert B. Marks Ridinger, Founders Library, Northern Illinois University, DeKalb.*

Adams, Mignon S., and Jacquelyn M. Morris. *Teaching Library Skills for Academic Credit.* Phoenix, Ariz.: Oryx Pr., 1985. 211p. $29.50. LC 83-43238. ISBN 0-89774-138-2.

Kumar, Girja, and Krishan Kumar. *Philosophy of User Education.* New Delhi, India: Vikas, 1983. 247p. $30. ISBN 0-7069-2288-3.

Nowadays it is difficult for a book on bibliographic instruction to stand out on the shelf. Such a plenitude of them crowd in. But *Teaching Library Skills for Academic Credit* is an exception—a pragmatic guide to BI that earns its appellation. A shopworn word in librarianship, *pragmatic* must be used carefully. With this in mind, part 1 explores theory and practice and thankfully is short on theory; academic librarians are well aware of why BI should exist. How to devise a profitable library course is more germane to current interest. Here this book excels. Establishing, planning, then developing materials for the library course constitute succinct, procedural chapters. Not to discourage the juggernaut of BI, a section on program survival forewarns of possible impediments to success. Although satisfactory, this section could have been lengthened with incognito examples of failure. In the chapters on teaching and evaluating the library course, old wounds open afresh. If academic librarians are overcognizant of the need for BI, they are equally sensitive to the fact that they are not always perceived as classroom teachers—that is, until they prove themselves. In light of this compromising position, the ideas put forth are highly requisite—so much so that, again, further elaboration would not seem tedious. Some academic librarians come to BI already in possession of a pleasant, communicative style. But for those unsure of their ability to teach, this crash course will be of assistance. Part 1 aptly demonstrates that whereas the theory behind BI satiates, exemplary practice whets the appetite.

Part 2 considers eighteen case studies of actual BI programs, some of which are heartening to hear about in that they surpass the usual one-credit-hour course. This is not to disparage the mainstay of most academic libraries, but to point out that progress has been made. Miami University offers "EDM 252: Scientific Information Sources" (full semester); Penn State, "Library Studies 470: Federal and Legal Information Resources" (team taught with law professor, fifteen weeks); Mankato State, "Sociology 206: Careers in Criminal Justice" (library component ten- to twelve-hour module); and Paterson College, "ELED 609: Research Seminar in Elementary School Subjects" (team taught with education professor, sixteen weeks). Team teaching appears to be the wave of the future for specialized BI courses; understandably so since profes-

sors do not want to relinquish their suzerainty. As asked for in Part 1, weaknesses of some of the programs are reported in these case studies—but not serious drawbacks or anything resembling failure. Too often promotion eclipses critical judgment; perhaps another book on BI dilemmas will correct the imbalance. Otherwise the case studies engage attention and satisfy curiosity to know how others go about BI.

Adequate documentation appears throughout with an extended bibliography at the end. An appendix offers a checklist of teaching techniques—sort of a reinvigorator for those eager to assault the classroom. This study is recommended for its strong pragmatic approach to, and for its update on, advances in BI.

In reading *Philosophy of User Education*, by the Indian authors G. Kumar, Jawaharlal Nehru University librarian, and K. Kumar, head of the department of Library and Information Science, University of Delhi, one reckons that experimental user education is predominately an American and British endeavor. Practically every footnote references a familiar U.S. study with Project LOEX cited often. What was expected—a review of strictly Indian philosophy on the subject or possibly an Asian survey—did not materialize. Not a criticism in itself, just somewhat of a surprise. If this book bore only a title one would guess, at least from the opening chapters, that an American had written it.

In textbook fashion a historical perspective begins the study. The Monteith College experiment leads off; next, Earlham, Swarthmore, Wabash, Hampshire colleges, and the University of Texas–Austin are recognized for their pioneering efforts in user education. The concept of the library-college is examined and aligned with independent study; both intended to fill the library with self-motivated students revived from classroom anesthesia. The second chapter on institutional framework explains why the American experience has been scrutinized: because of

democratic birthright user education is a natural outgrowth—academic librarians can challenge tired orthodoxy on campus and expected to be heeded. Here, Indian librarianship makes an appearance to admit that experimentation in user education has been slight to nil at home. The following chapters on the teaching function of librarians and teaching methods will be old hat to American readers; though, in Asia, the telling will probably stimulate discussion. The fifth chapter concerns less developed countries and user education; now the stimulus will be reversed to intrigue American readers. Technology transfer is the main voice of its plea. In the last chapter the anticipated philosophy unfurls. S. R. Ranganathan's five laws of library science acknowledged, the doctrine reverts to American ideals and accomplishments. Without imploring, Indian librarianship is shown the path to tread in the future.

Some minor annoyances crop up in this book. The paper is cheap, and typographical errors mar its pages. What would not be sexist language in India surely will be detected in this country. Footnotes accompany the text, but no bibliography. The appendixes are reprints of an instructional development model and analyses taken from U.S. journals. At any rate, it is recommended for its clear restatement of the user education movement in the West, for its entreaty to assist less developed countries to benefit from user education, and for its underlying purpose to awaken India to the promise of user education.—*Bill Bailey, Newton Gresham Library, Sam Houston State University, Huntsville, Texas.*

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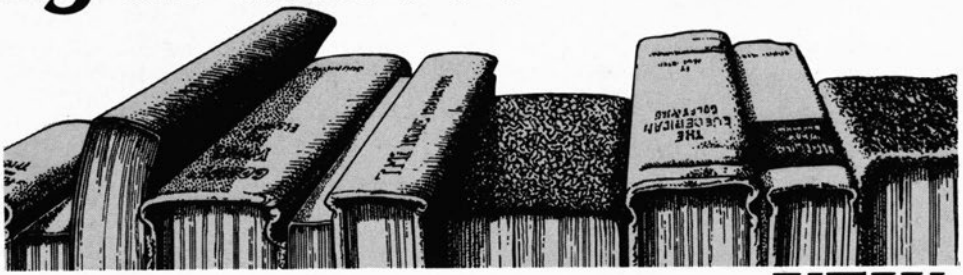

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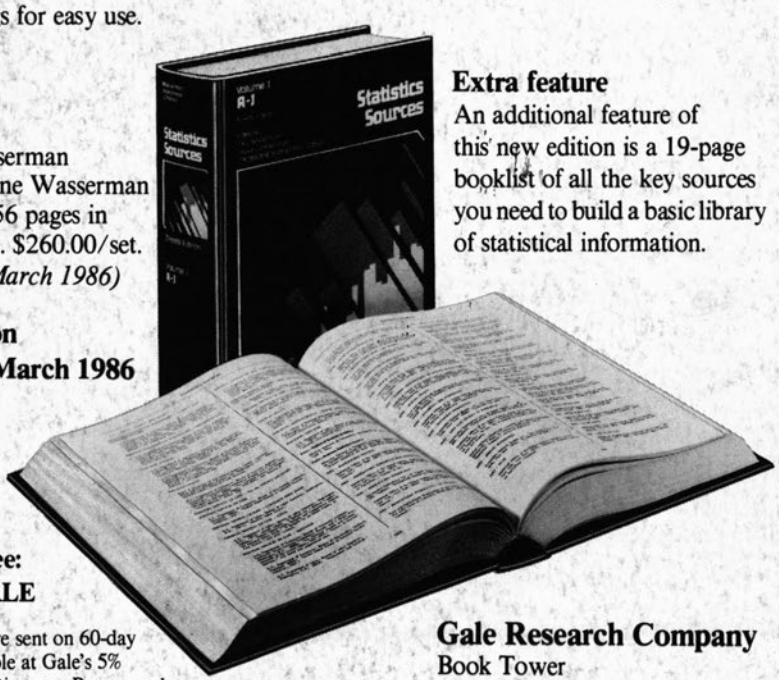

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